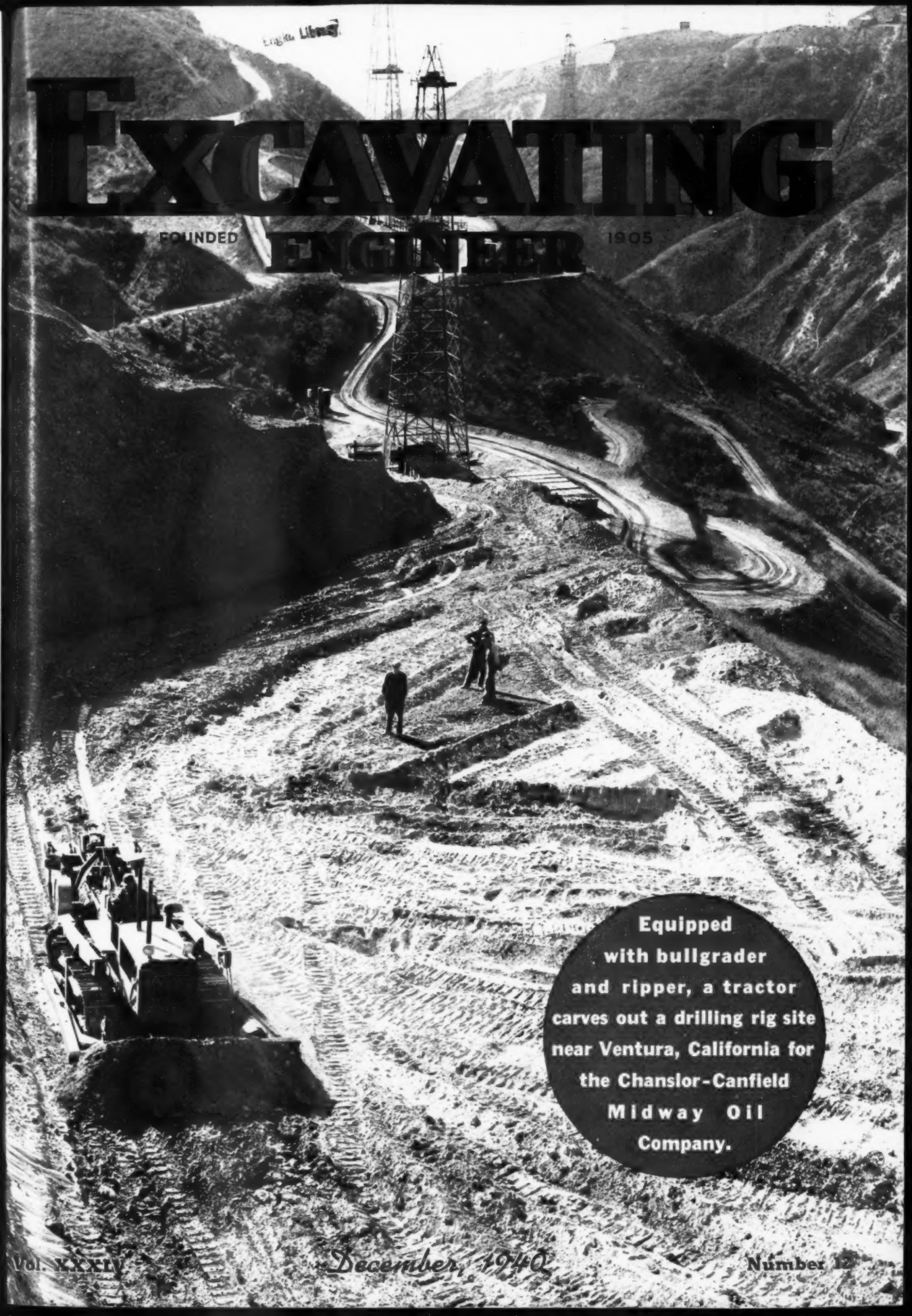
Engin. Library

EXCAVATING ENGINEER

FOUNDED 1905



Equipped with bullgrader and ripper, a tractor carves out a drilling rig site near Ventura, California for the Chanslor-Canfield Midway Oil Company.

Vol. XXXIV December, 1940 Number 12

3-W
3½-yard bucket on 80 foot boom. Other front-end combinations on request.

5-W
6-yard bucket on 100 foot boom. Other combinations on request.

OVER
A Billion YARDS

of experience built into these machines . . . . There is a field-proven size for every walking dragline job . . . .

BUCYRUS MONIGHAN

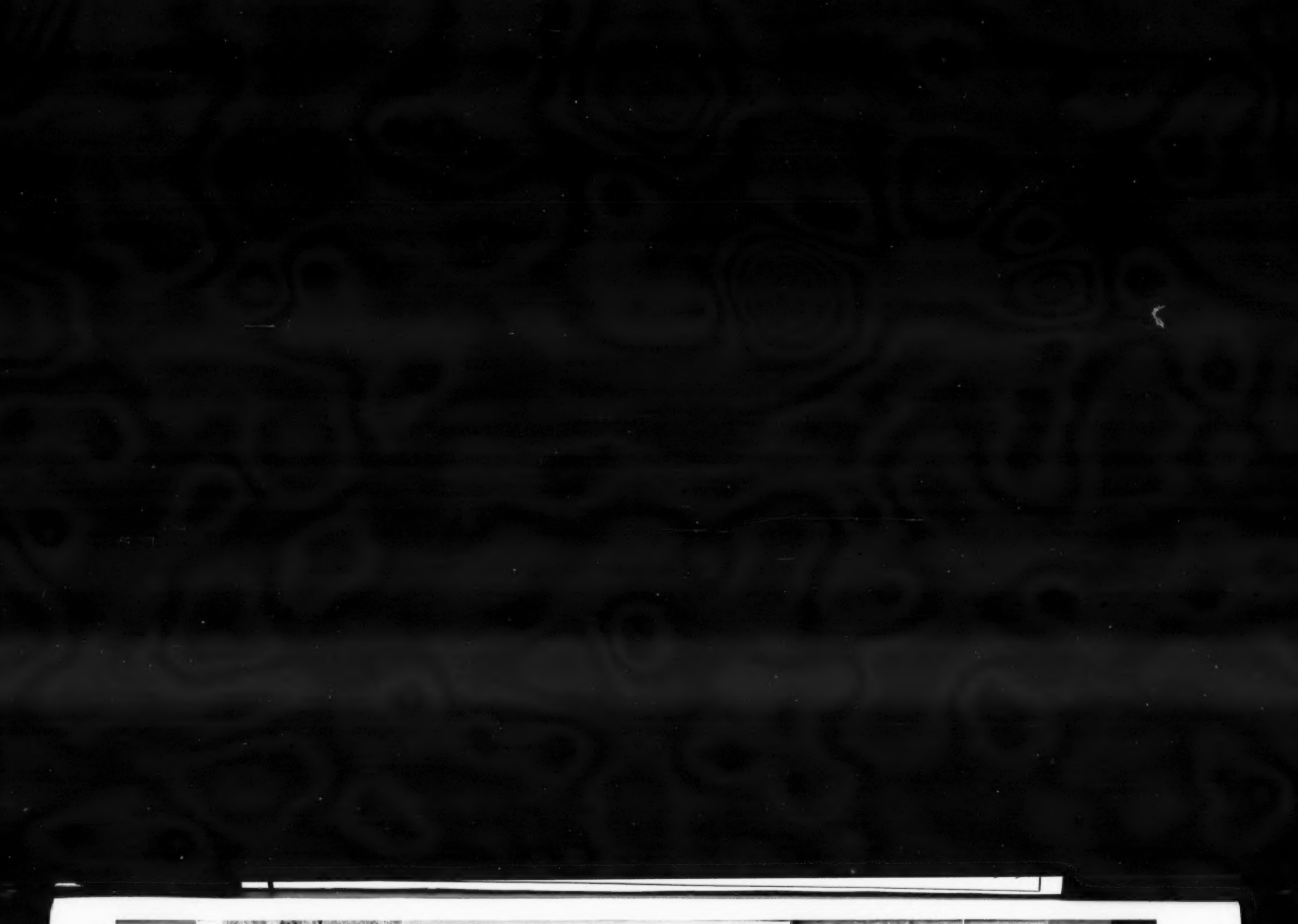
15-W
14-yard bucket on 180 foot boom. Other combinations available.

9-W
10-yard bucket on 160 foot boom. Other combinations available.

Sold by

Bucyrus-Erie

SOUTH MILWAUKEE, WISCONSIN



V

EXCAVATING ENGINEER

FOUNDED 1905

contents

Vol. XXXIV **December, 1940** No. 12

December Advertisers

American Chain & Cable Company .....3rd Cover
American Road Builders Assn... 727
Atlas Imperial Diesel Engine Company 736

Bethlehem Steel Corporation... 682
Bucyrus-Erie Company....690, 707, 715, 718, 721, 723, 724-725, 726
Bucyrus-Monighan Company .....2nd Cover

Caterpillar Tractor Company... 713
Concrete Industries Exposition. 732

Differential Steel Car Co..... 688

Ensign-Bickford Company, The. 686

For Sale (Classified).....734-735

General Electric 708-709

Haiss Manufacturing Company, George 720
Hayward Company, The..... 726
Hercules Powder Company..... 689

Ingersoll-Rand Company..... 681
International Harvester Co. .....4th Cover

Koehring Company 691

Leschen & Sons Rope Co., A.... 729
Lincoln, Hotel 732

Macwhyte Company 711

Northwest Engineering Company 687

Owen Bucket Company 733

Positions Wanted (Classified). 733

Roebling's Sons Co., John A.... 705
Rogers Brothers Corporation... 716

Sanford-Day Iron Works 719
Sauerman Brothers 722
Socony-Vacuum Oil Company, Inc. 684-685

Wellman Engineering Company, The 730
Whitcomb Locomotive Co., The. 717

Front Cover

About 50,000 cubic yards of dirt were cut out of this California hillside by an International-mounted Bucyrus-Erie bull-grader to make a level place for the oil well drilling operations of the Chanslor-Canfield Midway Oil Company.

Springfield Safety Valve—By Spencer Jones **692**

Construction of a large pressure flood-control conduit in Massachusetts involves a river re-location and some difficult excavation and construction work for F. H. McGraw and Company.

Eight Suggestions for Tax Economy—By Arthur Roberts ... **696**

Some practical pointers that will save you money in filling out that yearly headache producer—the income tax report.

Building America's No. 1 Airport—By Fred E. Kunkel **698**

Scooping 17,500,000 yards of material from the bottom of the Potomac River, U. S. Army Engineers build a 750-acre airport 10 minutes from the nation's capital.

Death Valley Gets a Live Idea—By Floyd Suter Bixby **700**

Pacific Coast Borax Company uses a blast hole drill to speed up stope backfilling operations at their borax mine in Death Valley.

Editorials **702**

More Roads for War Loads. 702
Nine-Year Construction High 703
Constructive Planning 703

Equipment You Ought to Know About **704**

Rock Drill Dust Control.... 704
Two-Cylinder Engine Starter 704
Ingersoll-Rand Scraper Hoist 704
Dodge Fuel Filter 704
Rex "Hi-Discharge" Truck Mixer 704
Caterpillar Model D312 Engine 706
Ideal Carbon Brush "Concavor" 706
Double Bucket Carryall.... 706
Newark Safety Transformer 706

Not in the Contract **710**

Shots From the Firing Line **714**

Renew New Jersey-Brooklyn Freight Tunnel Proposal. 714
Texas Allots Highway Funds 714
Are You Going? 714
Visit to Florida Drainage District 716
Concrete Industries Convention 717
Clay County, Missouri, Road Job 718
Young Leaves for New Post 718
Grand Coulee Slide Excavation 720
Massachusetts Defense Highways 720
Madera Canal Work Started 722
Panama Canal Construction 722
Federal Aid and Defense Highways 723

Obituary **726**

H. H. Timken, Sr.

Notes From the Manufacturers **732**

New Trade Literature **732**

Published Monthly by THE EXCAVATING ENGINEER PUBLISHING COMPANY, South Milwaukee, Wisconsin, U.S.A.

F. O. WYSE, *Manager* — ARNOLD ANDREWS, *Assistant Manager*
D. B. REED, JR., *Editor* — M. J. BARGENQUEST, *Associate Editor*
JOHN L. MORAVEC, *Art Director* — DELMAR COHEN, *Assistant Editor*
E. M. HEUSTON, *Sales Manager* — E. F. BRIESEMEISTER, *Assistant Editor*

ECA Member Controlled Circulation Audit

Regular subscription: 25 cents per copy, $2.50 a year; Canada, subject to publication policy, $3.50 per year. Special subscription: Upon application on card inserted in this number this publication will be sent frequently (not regularly) free of charge, to companies, executives and supervisors engaged actively in the industry of excavation.

COPYRIGHT 1940 BY THE EXCAVATING ENGINEER PUBLISHING COMPANY

Scoop Up Dollars As Well As Dirt

BY MINIMIZING MAINTENANCE COSTS

YOU NEED ROCK-BOTTOM MAINTENANCE costs for profitable excavating at today's competitive rates. To help assure minimum upkeep—use Gargoyle Viscolite Oils on your power shovels. These oils stoutly resist heat, moisture and shock. They will help you hold repair "outage" to a minimum.

CALL IN Socony-Vacuum fo

You'll Profit from these "Exclusives"

☛ SKILLED LUBRICATION COUNSE a Socony-Vacuum man backed b years' experience... the greatest in Petroleum Industry.

☛ A COMPLETE LINE of Lubric ... the scientifically correct lubri for every type of machine you now ... or will buy.

For your convenience in writing to Socony-Vacuum Oil Co., Inc., you will find a card bound in this issue.

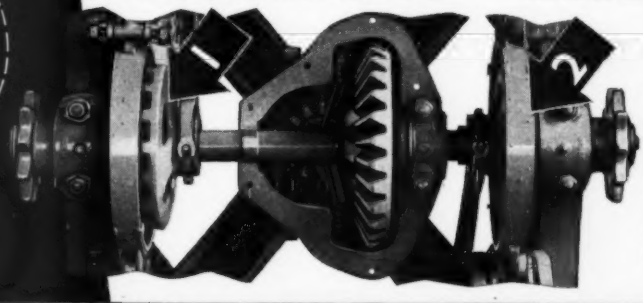
DON'T WASTE TIME ON THE TURNS

FULL SPEED AND POWER AHEAD—

Koehring does not need to "jockey", maneuver or make time-consuming, unnecessary moves to reach any section of the cut. Koehring travels the shortest way to the loading point. Turns are made directly . . . on grade or level . . . *saving time!* Tight places are no hindrance to a Koehring.

Watch a Koehring move and see the difference.

KOEHRING CO • Milwaukee



1. Positive jaw-clutch on ends of shaft engage for full power application with friction clutch control.

2. Positive brakes, controlled by lever, on end of shaft hold one or *both* crawlers as required.

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

For your convenience in writing to Koehring Co., you will find a card bound in this issue.

SPRINGFIELD

Construction of a large pressure flood control conduit in Massachusetts involves a river re-location and some difficult excavation and construction work for F. H. McGraw and Company

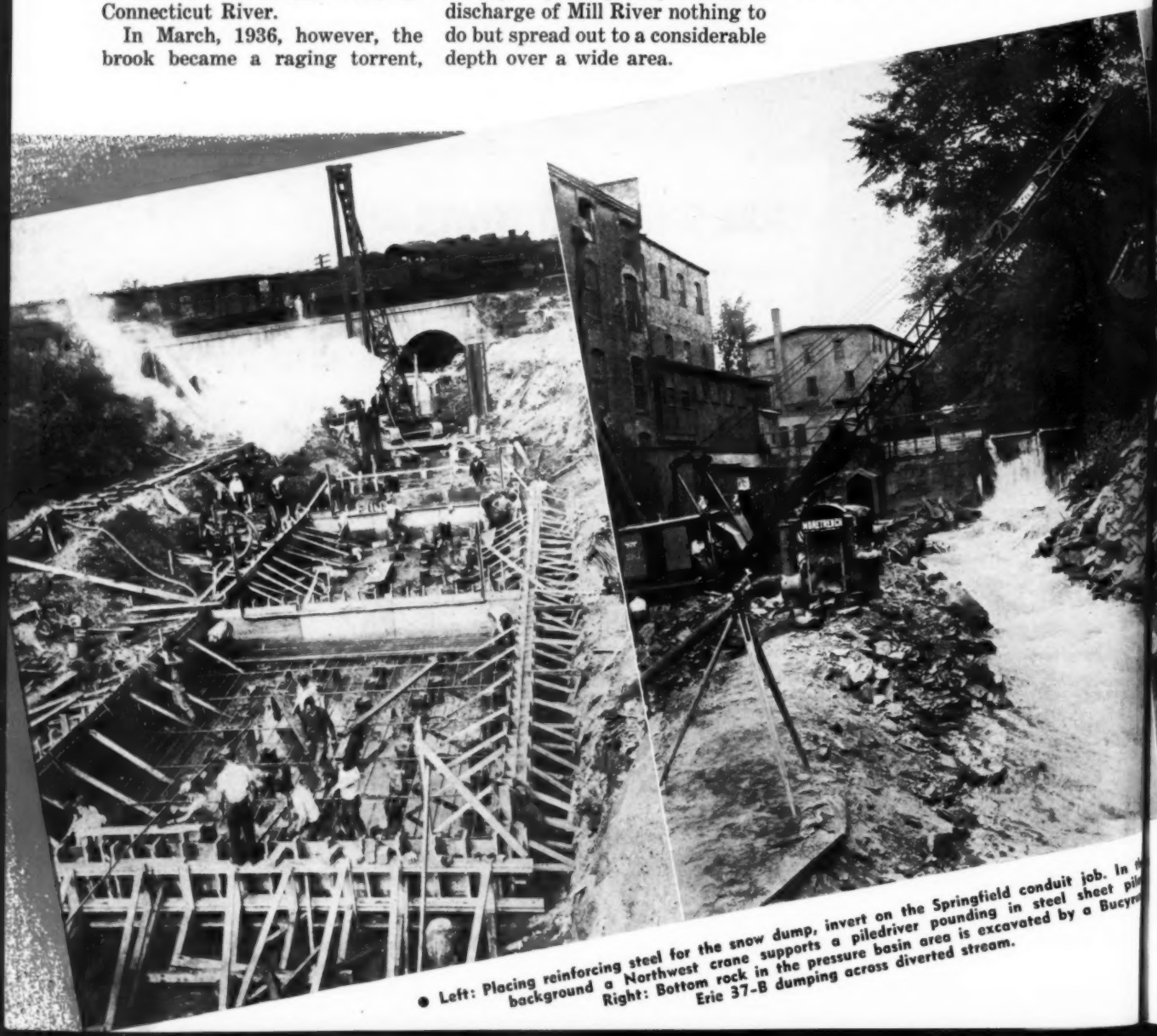
By SPENCER JONES

IN THE SOUTHERN section of Springfield, Massachusetts, a little stream, known as Mill River, has been a menace to surrounding buildings whenever the Connecticut River has reached flood stage. Normally Mill River is hardly more than a good sized brook, draining an area of about 37 square miles, and with an average discharge of 25 c.f.s. to 60 c.f.s. at its confluence with the Connecticut River.

In March, 1936, however, the brook became a raging torrent, discharging 666 c.f.s. into a huge flood-lake of its own making in back of the Springfield Dike on the east bank of the Connecticut River. For the big river had risen so high that its flood waters were backing up through the triple-arch openings under which Mill River ordinarily ran beneath a railroad embankment on the Connecticut River side of the dike, thus giving the greatly increased discharge of Mill River nothing to do but spread out to a considerable depth over a wide area.

Springfield Dike is, at this point, high enough to keep out flood water at any hitherto recorded stage, but a high dike isn't much good for holding back water when there are open holes through which the flood water can back up. And a flood in back of the dike at this particular point is an extremely destructive thing because the area is a manufacturing district with many factory buildings, one of them actually spanning Mill River.

The building furthest upstream in the area that was flooded in 1936, is the factory of the Bay State Thread Company, where a power dam was built many years



● Left: Placing reinforcing steel for the snow dump, invert on the Springfield conduit job. In the background a Northwest crane supports a piledriver pounding in steel sheet piling. Right: Bottom rock in the pressure basin area is excavated by a Bucyrus-Erie 37-B dumping across diverted stream.

Safety Valve

ago to put Mill River to work. Above this dam the grade of the stream bed is so steep and its rocky banks so high that run-off is swift and harmless. But below the dam, beyond the point where Mill River passes beneath the Bemis & Call factory, the ground level at the top of its banks is about the same height as the tops of the three arches through which the stream passes under the railroad embankment on the Connecticut River side of Springfield Avenue, Springfield's chief highway to and from the south.

The problem of how to make the waters of Mill River flow safely from the dam through the dike and into the Connecticut River, when both rivers are at flood stage, was tossed into the laps of the men at the U. S. Army Engineer Office, in Providence, Rhode Island. The accompanying general plan sketch shows how the Army Engineers figured out the solution.

Beginning at the downstream face of the Bay State Thread Company dam, a pressure basin about 150 feet long by 40 feet wide is being built, with the tops of its walls about six feet higher than the top of the dam. A rock cliff 30 feet high extends along one side of the Mill River and is being used as the southeasterly side of the pressure basin. The rock bottom of the basin is also being deepened about seven feet. Upstream side of the pressure

Below: Construction view of conduit showing collapsible ms in place for next concrete pour while backfilling operations continue r completed section. Note plywood flume in foreground diverting Mill River around activities. Right: The Bucyrus-Erie 1½-yard clamshell excavates conduit trench.

Dike. The result is that when the water in the Connecticut River rises to the height of these triple arches, there's nothing for Mill River to do except spread out sideways, flooding six or seven industrial plants, a group of city-owned garages and warehouses, the Hampden County Jail, as well as a considerable stretch of Columbus

basin is the existing dam, while along the northwesterly side of the little river a long, reinforced concrete wall extends roughly parallel to the thread mill, meeting the reinforced concrete downstream end wall of the pressure basin at the southern corner of the thread mill.

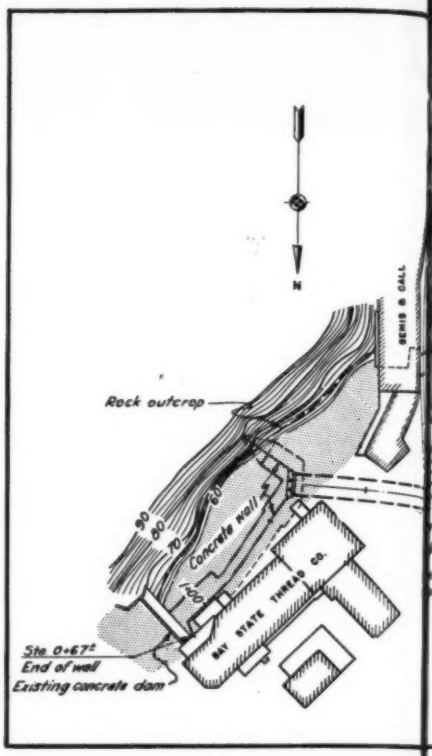
The outlet from the pressure basin (also the inlet structure of the reinforced concrete pressure conduit) is at the intersection of these two new concrete walls. At the pressure basin outlet (or conduit entrance) a structural steel trash catcher, encased in concrete, is provided. Provision is also made for the twin steel draft tube outlets from the Bay State Thread Company's turbines.

After a short transition section about 127 feet long, and with an invert slope of more than 11 feet in this short distance, the pressure conduit goes underground opposite the southwesterly end of the thread mill, passing under Main Street and continuing along Mill River Lane between the W. A. Newton and Company building and the City of Springfield's South End Yard to the former bed of Mill River. The entire distance of about 660 feet from the outlet of the pressure basin to the juncture with the former bed of Mill River involved excavation. The former river bed passed under the Bemis & Call building and continued southwesterly for about 600 feet to the Hedge & Mathies and the A. D. Donald & Company buildings, where it made a right hand, right angle turn and ran for another 200 feet in a northwesterly direction, followed by still another turn, this time to the left, to a direction about 23° north of west. The new pressure conduit comes into the former river bed about 60 feet downstream from this last mentioned curve.

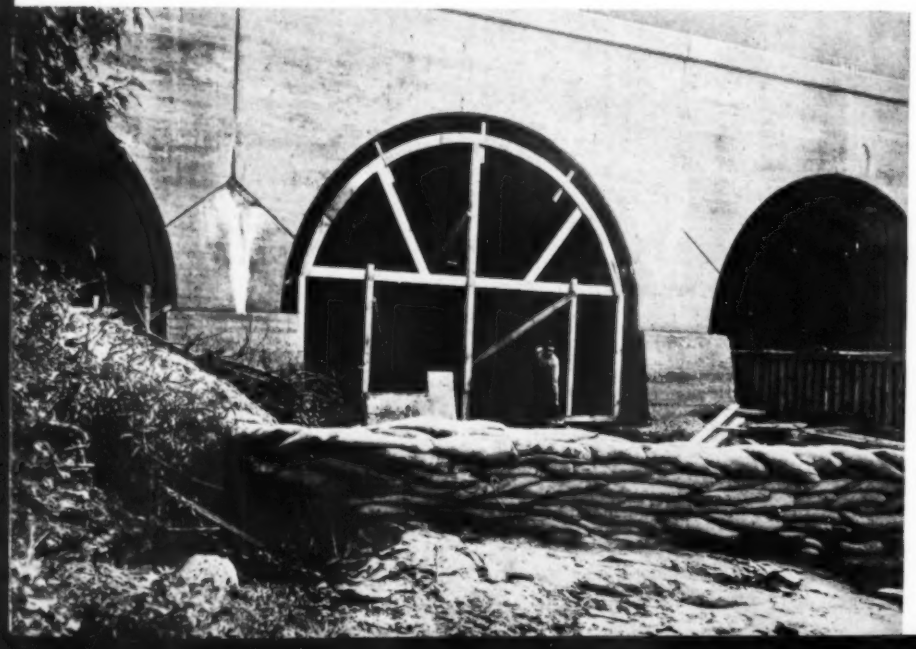
Conduit Connects With Snow Dump

From this point the pressure conduit follows the former river bed under the existing Columbus Avenue concrete bridge for some 440 feet to an outlet transition between the Arthur E. Center, Inc., building and the City of Springfield's stables. Here it connects with a reinforced concrete snow dump which is open at the top and has vertical walls ending at the triple concrete arch New York, New Haven & Hartford railroad bridge. This bridge is an integral part of the embankment west of the Springfield Dike, as previously mentioned, and since the pressure conduit passes through the center arch, the arches on either side are being sealed up tightly.

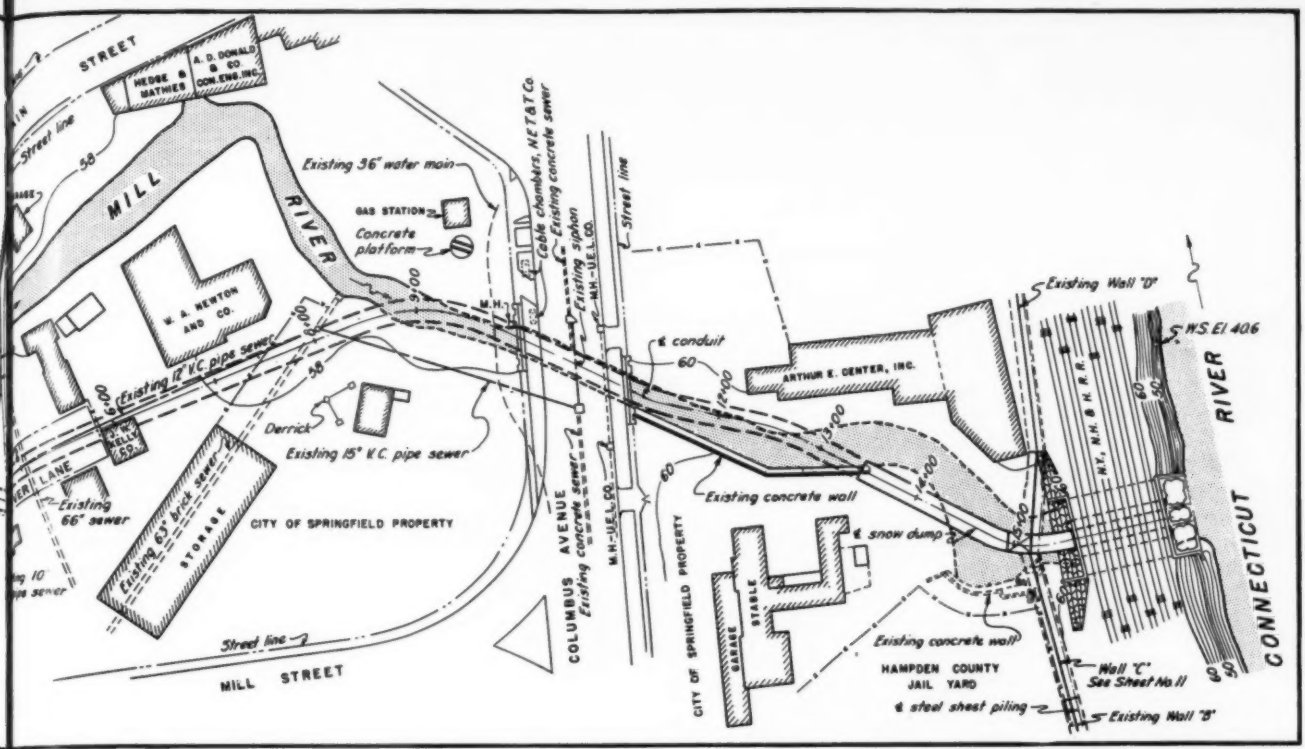
Reinforced concrete flood walls continue both north and south from the snow dump to fill a gap left across the narrow Mill River valley in the previously constructed reinforced concrete flood wall of the Springfield Dike. A complete sheet piling cut-off is being provided to seal this gap. The snow dump proper curves gently to the left at its westerly extremity and ends with a reinforced concrete bridge across the channel, with the downstream curb of the bridge lining up with the new concrete flood walls and sheet piling that seal the Springfield Dike. The center arch of the railroad bridge, into which the curved snow dump leads, is being provided with an 8-inch reinforced concrete lining and a reinforced concrete floor 1½ feet thick.



Summing up this rather involved description, the work authorized under the Flood Control Act of June 28, 1938, involves the furnishing of all plant, labor and materials for the construction of a pressure basin and a pressure conduit, capable of handling a discharge of 4,300 c.f.s., from the Bay State Thread Company dam across Mill River to the confluence of Mill River with the Connecticut River. The pressure basin requires the building of about 240 lineal feet of reinforced concrete walls. The reinforced concrete pressure conduit is about 1,100 feet long, the reinforced concrete snow dump is about 210 feet long, and the total length of the reinforced concrete flood walls necessary to close up the Springfield Dike is about 220 feet.



• View of triple arch railroad bridge under which the flood waters backed-up. The completed conduit will connect with the center arch, while the two outside arches will be closed.



• This general plan of the Mill River conduit contract, prepared by U. S. Engineers shows the solution of a difficult flood problem.

Contract for this flood control task was awarded to F. H. McGraw & Company, of Hartford, Connecticut, in May, 1940, on its bid of $227,000. Work was started immediately, as only 240 working days were allowed in the contract, and there was a penalty clause of $50 per day.

Construction of this Mill River "safety valve" involved the handling of 68,200 yards of dirt and rock, and the placing of 7,500 yards of reinforced concrete.

Job problems encountered were primarily those of working and storage space. The deepening of the pressure basin meant blasting and removal of layers of Connecticut red sandstone in the narrow section between the thread mill and the high sandstone cliff on the opposite side of Mill River. A diversion channel had to be constructed back of a temporary embankment to keep the river close to the cliff while that portion of the pressure basin bottom nearest to the thread mill was being excavated.

Rock Excavation Operations

Blast holes were drilled by two Ingersoll-Rand Jackhamers, operating two 8-hour shifts per day. Loading was Hercules 40% gelatine, sufficient 1¼-inch x 8-inch cartridges being used to loosen about one cubic yard of rock per seven pounds of explosive. Shots were fired using No. 6 Hercules blasting caps, a wired hook-up and a small blasting battery. Few holes were shot at a time because of the proximity to the thread mill, and all blasting was done under a mat.

The shattered rock was loaded out with a 37-B Bucyrus-Erie crane swinging a 1½-yard clamshell bucket on a 60-foot boom. Most of the material was spoiled at the base of the steep cliff which forms the southeasterly wall of the pressure basin. Frequently the clamshell bucket had to be filled by hand, particularly near the base of the old dam where only very light charges of explosive were used and working quarters were so cramped that the bucket couldn't get a decent bite.

While work on the pressure basin was forced to proceed with slowness under many difficulties, the other parts of the project stepped right along. The deep trench for the pressure conduit and that portion of the trench for the underground inlet transition section was quickly dug with another 37-B Bucyrus-Erie crane equipped with a 1½-yard clamshell bucket. From one to five feet of rock had to be removed from the bottom of this trench for a length of about 450 feet at its easterly end, and this was first blasted in the same manner as the deepened bottom of the pressure basin.

The 37-B was operated for two

(Continued on page 730)

• Open face view of a section of completed conduit, showing invert and arc shape of the Springfield "safety valve."

Eight Suggestions for Tax Economy

Some practical pointers that will save you money in filling out that yearly headache producer—the income tax report

By ARTHUR ROBERTS

TAXES HAVE advanced to a major item on the expense budget and the excavating contractor should take every lawful means to minimize them. He cannot afford to wait until after the taxable year before considering his tax problems any more than he can safely forget other expenses until the end of the year and then settle up without further ado. Tax-lax excavating contractors are not likely to take every allowable deduction and it may be too late to effect savings after the taxable year or period has been shelved by Father Time. Appropriate action must be taken during the taxable year.

These eight suggestions, based upon many years' experience with the tax problems and accounting problems of excavating contractors, should help keep taxes down.

1. Maintenance Expense Deductions

Do not capitalize maintenance expense. A road contractor may charge an ordinary repair of $350 to a property account, considering it an improvement or purposely increasing the value of his assets. Such entries increase tax. One excavating concern capitalized $6,214 in maintenance expenses in one year, increasing asset values by that sum, likewise profits on paper. This was done to make a more impressive looking financial statement but it increased the tax expense proportionately. Repairs that keep equipment and buildings in ordinarily efficient operating condition, are an expense. There are numerous borderline cases of this type, which may be considered an increase in capital or an expense. Be conservative in capitalizing such items where logical arguments will support them as expenses.

2. Depreciation Deductions

Deduct sufficient depreciation each year. Excavating contractors use expensive equipment, hence, the depreciation charge-offs are substantial and contractors often lose considerable money through over-payments on tax because they do not plan their depreciation schedules with care. A contractor is not permitted to take advantage in later years of his prior failure to take any depreciation allowance or an allowance inadequate under the known facts of prior years. More than one excavating contractor has lost out through a misconception of depreciation regulations in the Internal Revenue Code. One road contractor purchased a piece of earth-moving equipment for $10,000 in 1934. He estimated its useful life at 10 years. From 1934 to 1938, he deducted $5,000 for depreciation and it was allowed. Appraising the equipment in 1938, he decided that the depreciation should be $6,666.67. In other words, the equipment had depreciated ⅔ of its original cost, was worth only ⅓ of its original cost or $3,333.33. The reserve on his books was amended accordingly but this contractor then found that he could claim subsequent depreciation for the adjusted value only — $3,333.33 in the five remaining years of estimated life, thereby, losing a deduction of $1,666.67. This shows how important it is to give careful consideration to depreciation from the start so that you fix the life span and allowance per year as accurately as possible. Figure depreciation from the date of purchase. On real estate, deduct the cost of the land from the buildings. You cannot depreciate land for income tax purposes.

Do not set the same depreciation rate on all equipment or set an average depreciation allowance for all working assets. Contractors frequently pay higher taxes by doing this. Depreciation varies on road machinery and earth-moving equipment. The Treasury Department advises that the life of highway equipment including heavy dump trucks, has been found to be between six to eight years but this is an average, inclusive of all working assets used by road contractors and this average contains percentages on individual units that vary from 10 to 50 per cent. Even the same type of equipment may depreciate at different rates. A 20-ton diesel crane we have depreciated at 13 per cent yearly, whereas, we have taken 25 per cent on a five-ton job. One excavating concern depreciates all

• Depreciation schedules for new equipment should be planned with care to get the maximum benefit of tax deductions allowable.

its equipment at 15 per cent yearly, rollers, shovels, draglines, etc. Recent investigation disclosed that depreciation varied from 10 to 25 per cent on the units and that if the concern had taken depreciation on each machine individually or grouped similar items according to age and estimated normal life, they would have increased such deductions from income about 17 per cent annually.

Some contractors assume that because equipment is idle for a year, it should not carry depreciation. Court decisions indicate that depreciation should be taken whether equipment or buildings are used or not. If depreciation is not deducted for a unit not used, the annual rate must be applied toward the reduction of the remaining value in the asset, thereby decreasing loss upon abandonment. If the taxpayer fails to take the yearly allowance, he cannot take it in a later year and cannot make up the difference upon abandonment.

The method used in computing depreciation is more an accounting problem than one of tax, nevertheless, it has a bearing on tax economy. Depreciation, depletion and obsolescence are moot subjects in this and allied fields. Excavating contractors and those handling rock products should see that the method used is fair to themselves. A taxpayer is not limited to any one method as long as the allowance can be proven reasonable. If you want to switch from one method to another, it is necessary to get the consent of the Commissioner of Internal Revenue.

3. Obsolescence Deductions

Deduct for obsolescence. That which shortens the normal life of equipment is obsolescence. Actual experience and circumstances will determine when equipment or property should be retired from use. Many concerns overlook obsolescence, which may be computed separately or with depreciation. Some assets grow obsolete before they wear out and are a drag on profits even though they are mechanically fit. There are two kinds of obsolescence, accrued and anticipated, this latter is deductible annually with depreciation. Accrued obsolescence, sometimes called forced obsolescence, may be deductible in full, being the difference between the depreciated cost of the property and its salvage or trade-in value. However, these deductions are usually incidental to renewals and replacements.

4. Loss Carry-Over Deductions

Take the permissible credit for a loss carry-over. The 1939 amendment to the Internal Revenue Code allows the taxpayer to carry over losses sustained in 1939 as a deduction from 1940 income, and if the loss is greater than 1940 income, the excess may be carried into 1941. Such losses may extend for two years. The excavating business may be tops one year and McGinty the next. In the past, equipment not used during loss years was frequently not depreciated because the deductions would have shown only a greater loss, which could not be carried over for credit in subsequent years. In future, such practices should be discontinued. Report full depreciation in good years and bad because the loss carry-over now in effect may provide economies on tax.

5. Expense Deductions

Make each year's tax return complete in itself. If certain expenses are omitted during the taxable year, you cannot deduct them from the income of the next year and such omissions are often numerous when the taxpayer waits until the last minute to file returns. All expenses and accrued items, which are expenses not yet paid but due, should be entered in the taxable year, otherwise, there will be an over-statement of liability. If your books are kept on a cash basis, pay all bills before the year ends. Sometimes this necessitates borrowing money but the tax economies effected by these deductions make it desirable. Where books are kept on an accrual basis, excavating contractors sometimes overlook interest, payroll and other obligations due to the last day of the taxable year

• Accurate cost records of all equipment not only help you claim full expense deductions but enable you to check on the continued efficiency of important equipment.

because these obligations haven't been paid yet. Pro-rate these expenses to the end of the taxable year and deduct from gross income even though you pay them after the end of the year.

Amounts paid because of injuries received by employes are proper deductions as expenses, limited to the loss not covered by insurance or otherwise. If no compensation is received, the loss is fully deductible within the year. Losses incurred in any business transaction are ordinarily deductible, provided they are closed transactions sustained during the taxable year. If equipment is discarded, any claim for loss must be made in the year in which the action is taken. In general, the income tax law is concerned with realized losses and realized gains sustained during the taxable year, hence, the excavating contractor should see that his tax return is complete because he may not be allowed credit in subsequent years.

6. Accurate Cost Records

Keep accurate cost records and general accounts. This begets profitable selling prices for products and service. Excavating contractors take too many jobs at a

(Continued on page 728)

Building America's N

Scooping 17,500,000 yards of material from the bottom of the Potomac River, U. S. Army Engineers build a 750-acre airport 10 minutes from the nation's capitol

By FRED E. KUNKEL

COMPLETION OF dirt moving operations in November, 1940 at Gravelly Point, Virginia marked the end of an unusually interesting series of excavating tasks entailed in the construction of the Washington National Airport. Dredges, draglines, clamshells, and bullgraders and 'dozers were used by U. S. Army Engineers in the creation of this 750-acre airport on the banks of the Potomac River.

Built at a cost of 10 million dollars, the Washington National Airport will provide long needed airport facilities for the nation's capitol at a comparatively low cost of about $10,000 an acre (without buildings). Considering that the airport is only 10 minutes by automobile from the heart of the capitol, this acreage price was a great deal less than available real estate.

Specifications for the 750-acre airport include a landing area of 520 acres with four runways ranging in length from 4,100 feet for the east-west runway, 4,900 for the north-east, 5,210 for the north-west, and approximately 6,850 feet for the principal one, the north-south runway. Jutting out into the Potomac River, the airport has the additional advantage of having three approaches over open water. This location increases the effective area of the airport materially over its actual size.

All excavation work on the project, which was financed by PWA and WPA funds, was handled with government-owned equipment or machines rented by U. S. Army Engineers from private contractors. These rental contracts were let to the lowest bidders.

Of the total airport area of 750 acres, 300 acres were fast ground and 450 acres entirely fill. The majority of this fill was taken from the bottom of the Potomac River by three leased hydraulic pipeline dredges and two government-owned hydraulic pipeline dredges which started operations in November, 1938.

The cost for the handling of the 17,500,000 yards of hydraulic fill was 17c a cubic yard. The following companies and dredges fulfilled this contract: American Dredging Company of Philadelphia, Pennsylvania, dredge "Pennsylvania"; McWilliams Dredging Company, New Orleans, Louisiana, dredge "Gulf Stream"; and Standard Dredging Corporation, New York City, dredge "Lake Ellendale." The two smaller government-owned dredges which also worked on the project were the "Talcott" and "Dalecarlia."

A unique feature of the hydraulic fill placing operations was the actual "building in" of airport runways. Material containing a high percentage of sand, gravel, and cobbles was piped directly to the runway areas forming a highly compacted base. Less desirable materials (fine sand and silt) were by-passed into the open areas between the runways. These areas acted as sedimentation basins where the loose material was drained and later consolidated.

...d Airport

Tractor-Bullgrader Operations

Grading operations on the 300-acre high land area of the airport were carried on concurrently with the dredging work and about 1,800,000 yards were borrowed from this area to complete the fill portion of the field. Army engineers plan to move an additional 500,000 yards next spring and summer. A contractor-rented fleet of 31 tractor-mounted bullgraders and bulldozers handled the greater part of this large-scale grading job.

To this equipment, U. S. Army Engineers assigned the job of moving, mixing, drying, and grading the material on the entire field surface. Working continuously, 24 hours a day, with three shifts of operators, the tractors pushed and rolled the dried hydraulic fill material into final shape.

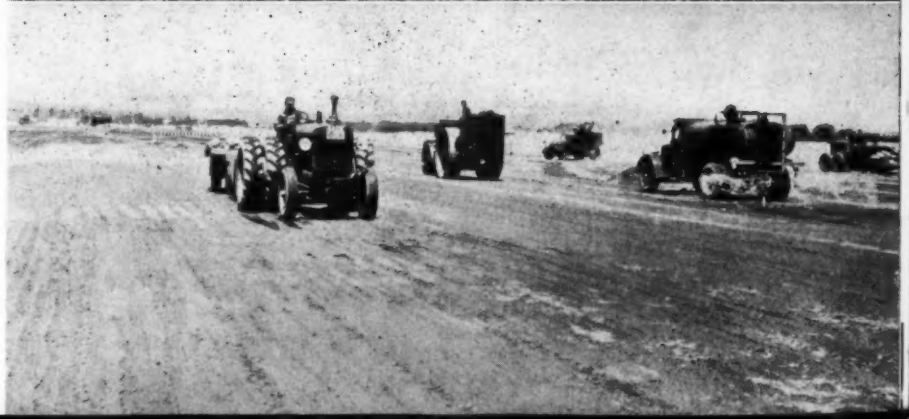
Although complicated by a high water table, the field drainage problem was solved by a system of open cut trenches which will carry excess water to the Potomac River.

All field runways have a stabilized base resting on sand and gravel fills varying from 10 to 30 feet. The upper 9 to 12 inches of this fill was stabilized by the manipulation and compaction activities of bullgraders, disk harrows, heavy duty cultivators, turn plow, road grader, wobbly-wheeled roller, and a three wheel roller. The compacted "soil concrete" base formed by these operations has a minimum density of 130 pounds per cubic foot and is built at an estimated cost of 50 cents per square yard.

Asphalt Surface for Runways

On top of this base, a 3½-inch surface layer of hot-mixed, hot-laid asphaltic concrete is placed in strips averaging 10 feet in width. The contractor-rented and oper-

(Continued on page 728)



• **Top: Two International-mounted Bucyrus-Erie bullgraders rough grading the hydraulic dredge fill. Note light tower for night operations in background. Center: Tractor-towed cultivators and disk harrows mix runway soil. Bottom: Sprinkling and rolling operations in the formation of the subgrade surface.**

DEATH VA

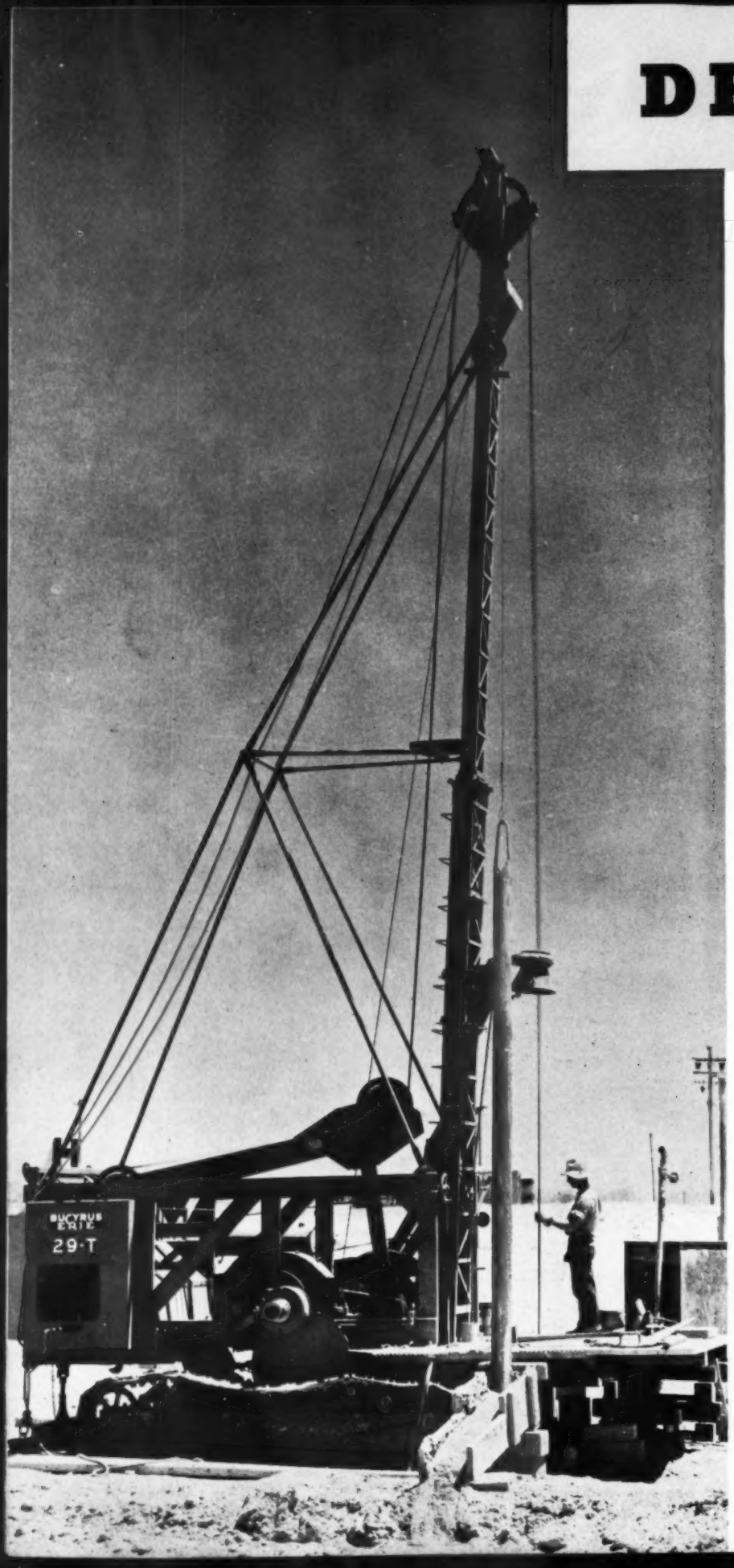
Pacific Coast Borax Company uses a blast hole drill to speed up stope backfilling operations at their borax mine in Death Valley

By FLOYD SUTER BIXBY

NEAR THE SOUTH end of Death Valley, in the Mojave Desert of California, situated on a bleak, desolate stretch of sand and alkali, sets a group of gray buildings. At first view, through the shimmering summer heat which bakes the desert for miles, they look like an unreal mirage. These structures are the headquarters for the borax plant of the Pacific Coast Borax Company, manufacturers and miners of the nationally famous "Twenty Mule Team" brand of borax and borax products.

Driving through the desert, you can no longer see the bleached white bones of men and oxen and horses which dotted the desert in the 1870's. The bones have returned to the dust from whence they came, but the desert is still the same. Grotesque Joshua trees fling their ungainly arms skyward, the coyotes howl on the lonely sands at night, and the scene is unchanged from pioneer days save for the black topped highway and the row of gray buildings dancing on the horizon in the stifling heat.

At the job site, all feeling of unrealness changes. The sound of running machinery hums through the gray buildings. In the general office, upstairs in one of the structures, you see three clerks, freshly shaved, wearing coats in an air



• Stope blocks 350 feet below the surface at the Pacific Coast Borax Company mine are backfilled through 10-inch holes drilled by this Bucyrus-Erie 29-T.

LLEY GETS A LIVE IDEA

conditioned room. The company nurse, youthfully feminine and lovely in a white silk uniform and cap, ducks into her little office after a brisk walk through 118 degrees Fahrenheit outside. An elevator, white with the dust of native ore, comes up above the ground. A small group of miners, with miner's caps and lights, walk across the yard toward their homes in the nearby camp.

Below the surface of the desert, at a depth of 350 feet, is the reason for this activity. Situated over what is known as the Baker deposit, the mine supplies a good per cent of the boron taken from Southern California. Winter and summer, the business of mining this borax containing mineral continues.

Backfilling Stope Blocks

One of the most unusual and interesting features of the mining operations is the backfilling of the stope blocks after the ore has been taken out by the miners and hauled away on the haulage roads of the underground railway system. To replace the mined ore with backfilled material hauled in over the same route as the outcoming ore, or to employ any similar method, would obviously be much too expensive and would actually retard the progress of removing ore. In any mining system of shrinkage stoping where backfill must be done, it must be accomplished as cheaply as possible.

A Bucyrus-Erie 29-T drill was brought in some time ago, equipped with 8-inch and 10-inch drills. Under the method proposed, previously tried successfully with a Model 50 Armstrong drill, two 10-inch holes were drilled into each stope through 350 feet of overburden, and the backfill material was placed from the ground surface.

The 350 feet of overburden is composed mostly of alluvium and extends almost down to the ore formation being taken out. Drilling is fairly easy, providing the operator "takes it easy" and doesn't strike too many boulders on the way down. Driving down through 350 feet of alluvium to hit an opening as small as the stopes shown on the accompanying sketch is about the hardest part of the program, but so far only one hole has ever gone astray.

It was found best for the purposes to drill an 8-inch hole with the Bucyrus-Erie drill, reaming later with a 10-inch bit. The 8-inch hole was pushed down through the 350 feet of overburden in an average drilling time of 45 hours. Reaming the hole to the 10-inch size turned out to be a matter of four to eight hours, depending mostly on whether or not any boulders of great size were encountered. Fully assembled in working condition, the weight of tools carried by the 29-T is about 1,800 pounds. Drills are sharpened on the job in a company machine shop which also makes operating repairs to mining machinery.

It is not usually necessary to place casing in the holes which have been dug. When this becomes necessary, however, owing to the type of formation encountered, a 10-inch casing is placed in the hole down to a point where the walls stand in shape. Before the holes are drilled, the ground is excavated six to eight feet deep from the natural ground surface by a Caterpillar D7, equipped with a LeTourneau dozer. When the hole has been completed, a grizzly with a rectangular mesh of four and six inches is set securely in place directly over the hole. This is done to strain the material down through the opening and to keep out stones and boulders which would otherwise plug up the hole. Working under average conditions, about 350 cubic yards of material is backfilled in an 8-hour shift.

Where the topography of the surrounding country is comparatively high, material is pushed to the screen by the Caterpillar D7 bulldozer. One man tends the grizzly, picking out the stones which accumulate on the iron grating, and unplugging material which wants to fall in a bunch before going through. As a rule, the material falls through easily with a gentle poke with a steel bar, because it is a mixture of sand and

(Continued on page 712)

• Left: Backfill material is hauled to a low hole location with a LeTourneau 6-yard scraper. Below: The Caterpillar-powered bulldozer pushes fill material to a stope grizzly near the miner's living quarters.

EXCAVATING ENGINEER

FOUNDED 1905

A Monthly Publication

Devoted to the Excavating Industry

The Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

F. O. WYSE, *Manager*
ARNOLD ANDREWS, *Assistant Manager*
D. B. REED, JR., *Editor*
M. J. BARGENQUEST, *Associate Editor*
JOHN I. MORAVEC, *Art Director*
DELMAR COHEN, *Assistant Editor*
E. M. HEUSTON, *Sales Manager*
E. F. BRIESEMEISTER, *Assistant Editor*

More Roads for War Loads

By Charles M. Upham

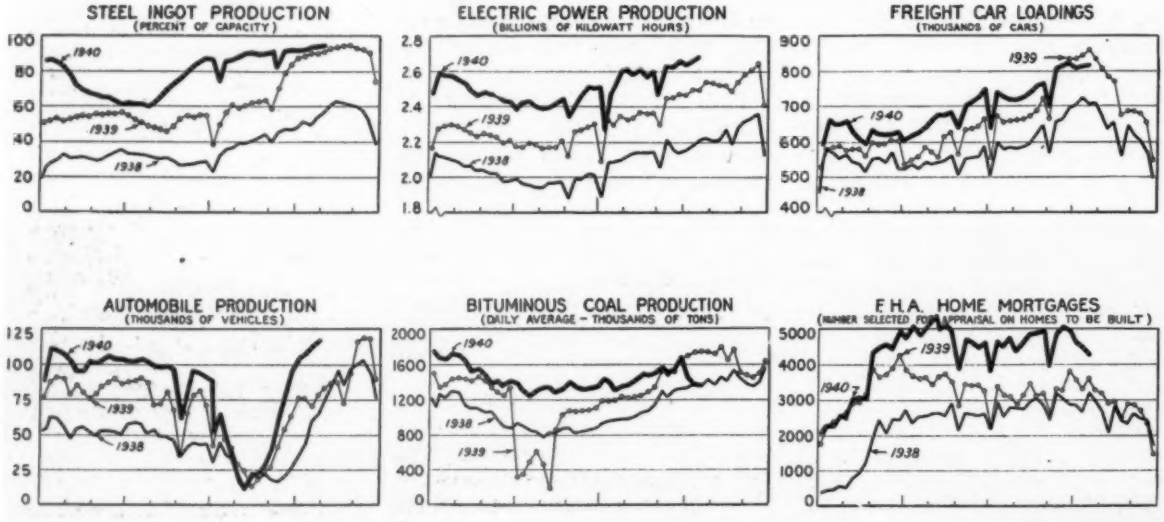
America leads the world in mechanical progress. Machine developments in this country show the way to other nations. Gigantic construction projects, plus efficient industrial production, are the offspring of America's inventive genius. Machines have shaped the New World's way of life since the turn of the century. From the wheels of American industry — from the nation's construction expansion spring an unsurpassed standard of living, educational system, era of culture. American people thrill to the glories of a more brilliant civilization. This is the "Age of Technocracy." Its influence is felt around the world. Other nations call our engineers to help them—Russia, Turkey, China, Mexico and the Republics of South America. Production systems are organized. Good things from the good earth soon flow from mine, well and farm to the factory — from there to foreign ports. New riches are exchanged. The latent wealth and power of a nation is brought to the service of man.

Once devoted to the betterment of mankind, a half-century of concentrated mechanical progress now serves the Gods of War. Tanks replace tractors on the assembly line. Bombers supersede transocean planes, warships take precedence over merchant vessels. A state of national emergency exists. There is no real progress except where improvement benefits the national defense. Peacetime industry halts its forward march. There is one instrument of peace, however, that the War Department insists upon — the improvement and construction of good roads.

Mobilization of the nation's manpower and industrial energy for the cause of national preparedness also calls the road builders of America into the patriotic circle. The construction of better, safer, more durable, more modern highways—the building of stronger and more adequate bridges produce near-perfect motorized-army efficiency. The roads of America must be prepared—they must be made strong to meet the demands of any military eventuality. The machines and materials of American road building, therefore, take equal rank with military equipment and munitions as indispensable elements in the national defense.

Orders from the national preparedness program co-ordinators call for "full speed ahead" in the production of planes, ships, tanks, guns and other weapons of modern warfare. The same orders might well and wisely be given to the manufacturers of American road-building equipment. Road graders, pavers and all the other machines and materials of road construction may play a less dramatic role in the nation's defense, but their contribution to the preservation of the democratic way of living is no less important. Consider America's present emergency. While still at peace, the nation must prepare for war. National preparedness, therefore, takes the form of stepped-up production. This, in turn, necessitates the rapid transportation of raw materials and finished products from source of supply to place of demand. A great bulk of this transportation must take place by truck over the highway. At the same time, army maneuvers are conducted to train the nation's manpower. These troops must also be transported over roads. Already the peacetime demand on the national highway system has increased by leaps and bounds. A national lottery is calling America's largest peacetime army into

WEEKLY BUSINESS INDICATORS



service. Bulldozers, material mixers and spreaders and other tools of the highway industry must precede army occupation of designated training centers. Troops, tanks and truck cannot function effectively or swiftly without all-weather roads.

The job of the American road builder does not stop with the outbreak of actual conflict. Roads torn up by army movement or shattered by enemy attack require immediate repair. Men, materials and machines must be constantly at hand to rebuild roadways and construct bridges. The American road builder — his machines, his materials — belongs in America's first line of defense. The success of the combat force that follows depends upon his successful efforts to pave the way. In peacetime preparedness and in actual combat, the man in the armored tank and the man in the road-building machine must work shoulder to shoulder. When normal times return, war machinery and road equipment can share the same parade. They will have served the cause of national defense with equal fidelity.

"... and right here, chief, is where the new bridge goes!"

Nine-Year Construction High

The year 1940 has been the largest construction year since 1931, and the largest residential building year since 1929. Dollar volume of construction contracts awarded in the 37 states east of the Rocky Mountains, during the first nine months of this year, increased five and one half per cent over the corresponding period of 1939, according to F. W. Dodge Corporation reports. The comparative figures were $2,784,352,000 for the first nine months of this year and $2,634,802,000 for the first nine months of 1939.

The increase came largely in the third quarter of the year, stimulated by the national defense program, which has imparted an acceleration to construction activity likely to continue through the final quarter of 1940 and well into the first half of next year. First quarter contracts this year ran 13 per cent behind the first quarter of 1939; second quarter contracts ran three per cent ahead of last year's second quarter; this year's third quarter ran 24 per cent ahead of the third quarter of 1939.

This year's nine-months' net gain over last year, amounting to $150,000,000, included gains of $50,000,000 in commercial buildings, $114,000,000 in manufacturing building, and $125,000,000 in residential building; partially offsetting these gains were declines of $94,000,000 in public and institutional buildings and $45,000,000 in heavy engineering construction (public works and utilities). Private-ownership projects as a whole gained by $222,000,000, while public-ownership projects declined by $72,000,000.

Construction for the defense program is now filling the gap left by the tapering off of our earlier public works programs. Defense construction includes building and engineering structures of nearly all the important classifications, such as industrial, residential, hospital, educational, and administrative buildings, as well as various kinds of engineering work. Defense construction has thus far little more than made a start; continued gains in the fourth quarter are likely to bring the year's construction total to a figure seven to 10 per cent greater than last year's final figure. In addition to continued defense construction projects in 1941, increased industrial activity and employment are likely to stimulate increased demand for private building next year, unless building costs should rise too rapidly.

Constructive Planning

The great difference between men who succeed and those who fail is the great difference between their minds! The most vital things in your life are your mental attitudes. Your life at this moment is but the massed result of the mental attitude of your yesterdays.

The first step toward your desires is taken when you realize that you can control mental attitude. You can't think one way and act another way—you can't think failure and then build success. Acquire a dominant desire; it is a strong incentive for success.

Know what you want, and then acquire an intense desire for it. Make up your mind what you want the years ahead to do for you, and then bend everything in your life, directly or indirectly, to serve that one aim.

CHRISTMAS SEALS

Help to Protect Your Home from Tuberculosis

Equipment

you ought to KNOW ABOUT

For further details about the equipment on this page please write to the manufacturer, mentioning Excavating Engineer.

Rock drill dust control

Manufacturer: Markley Dust Control System, Inc., 306 East 123rd Street, New York, New York.

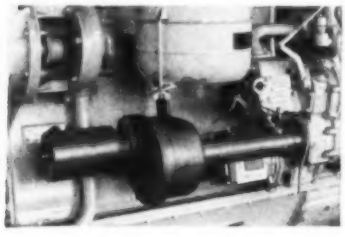
Claims: Simple to install and operate, the system is portable and is applicable to any type of small-bore rock drilling. Various

parts are connected by long lengths of hose and can, therefore, be spotted out of the way of other job operations. All of the drill dust is trapped at the point of origin—the drill hole—by the effective double-separation principle. This includes catching fine, invisible particles that are the causes of lung diseases. Low in first cost and cost of operation. Life of drill steel is prolonged and sharpening costs are reduced because the drill hole is kept clean of dust and chips. Faster drilling also results. Wet drilling is eliminated.

Two-cylinder engine starter

Manufacturer: H. K. Porter Company, Inc., 4936 Harrison Street, Pittsburgh, Pennsylvania.

Claims: Originally developed for use in connection with Porter

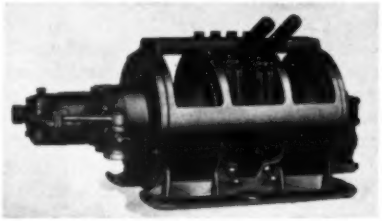


diesel locomotives and recently changed to a form suitable for easy installation on all Caterpillar engines. Can be employed in the operation of diesel cranes, shovels, bulldozers and similar equipment. Consists of a conventional automotive type starter, fitted with a Bendix gear which drives a spur gear. Extension shaft attached to the spur gear engages the main crankshaft of the small gas engine, thus starting the engine. Cast iron housing encloses the entire gear unit. Provisions made for lubrication of shaft bearings. Hand and magnetic switch also furnished with assembly. Choice of starting motor, depending upon generator and battery equipment available. Operated electrically and said to save its costs in a few months by the avoidance of lost operating time.

Ingersoll-Rand scraper hoist

Manufacturer: Ingersoll-Rand Company, 11 Broadway, New York, New York.

Claims: Lightest and most compact double-drum scraper hoist



ever built. Unit weighs only 250 lbs. (without cable guides). Compactness will allow it to be passed through an opening 13″x15″.

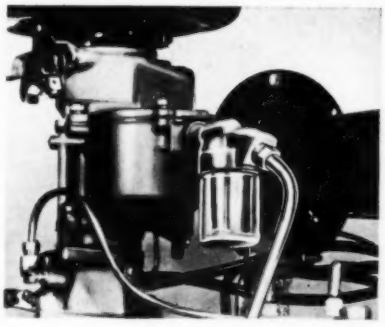
Hoist designed especially for small scraping jobs in thin, narrow veins or stopes, irregular veins, cross cuts, spreading wastes, development work, etc. Has a cable pull of 650 to 1,000 lbs., cable speed of 125 to 150 ft. per minute. Air or electric drive available.

Construction details include: Individual clutch lever control for each drum. Clutch adjustment easily made by hand, no tools required. Helical steel tooth gears totally enclosed and operate in a grease bath. Anti-friction bearings support all rotating parts.

Dodge fuel filter

Manufacturer: Dodge Division, Chrysler Corporation, Detroit, Michigan.

Claims: New metal-edge fuel filter, in addition to the auxiliary filter screen built into the fuel

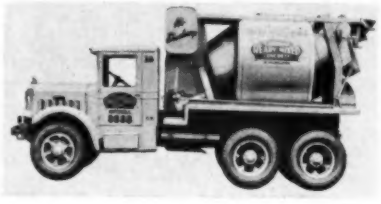


pump, is now mounted at the carburetor. Double protection takes all dirt out of the fuel, preventing grit from entering the carburetor and traveling on to the cylinders and other moving parts. Result is prolonged engine life and greater efficiency.

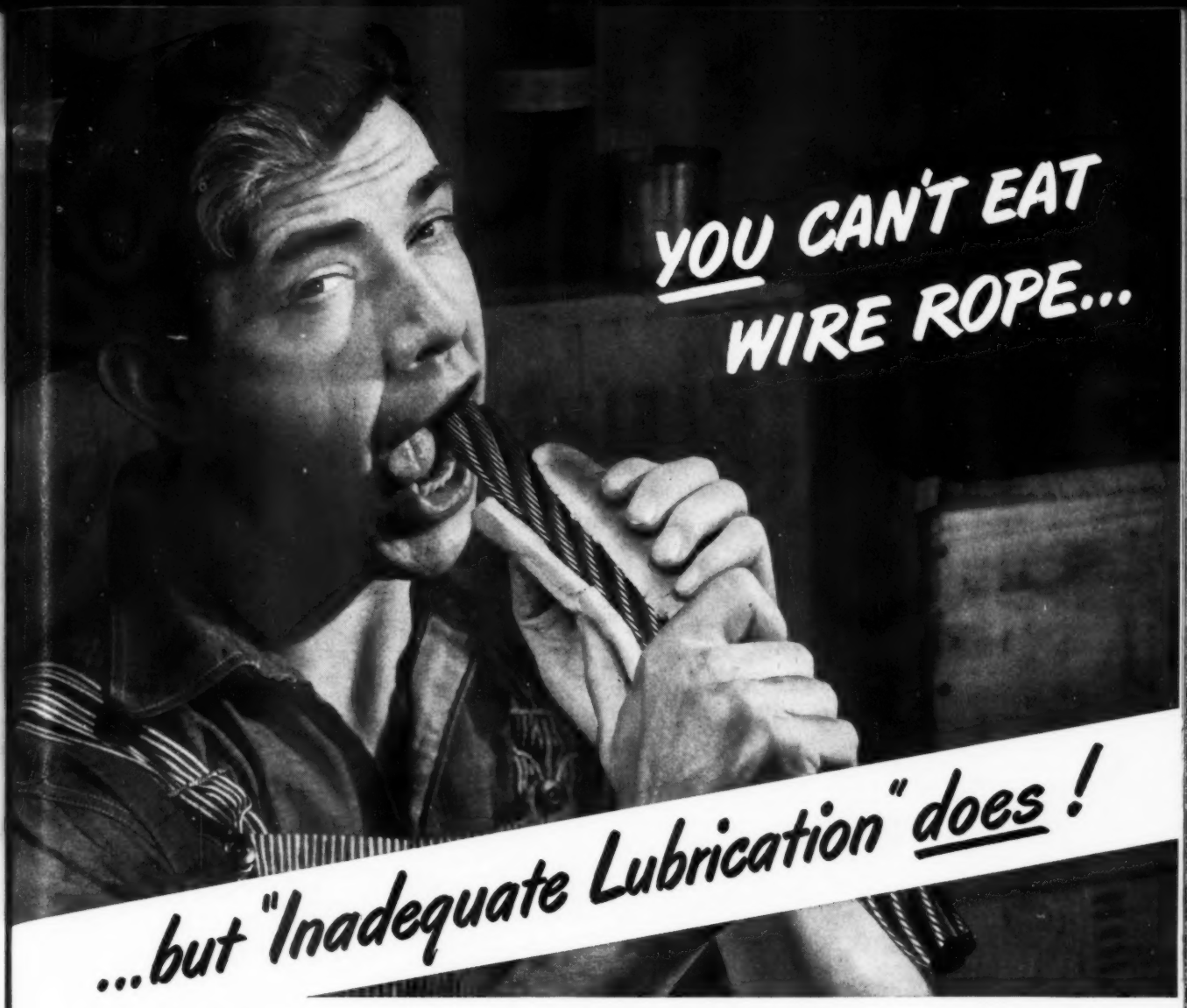
Rex "Hi-Discharge" truck mixer

Manufacturer: Chain Belt Company, Milwaukee, Wisconsin.

Claims: New mixing principle makes drum self cleaning while mixing because there are no inaccessible places for cement to



build up and require unusual cleaning at the end of a day's run. Results in a faster and better mix. Drum has one opening for both



Perhaps you never thought of lubrication in just this way — but picture to yourself thousands of tiny "bearings" sliding and pressing against each other. Naturally, they must be lubricated — and naturally you'll see that they are lubricated in your wire ropes — when you realize what it means in dollars and cents.

A proper wire rope lubricant regularly applied to the rope on the job, forms a protective coating that keeps those thousands of "bearings" operating with minimum friction. The result: — Wire fatigue and corrosion checked; more uniform wear; longer rope life.

Be sure your lubricant is the *right* one, that you are applying it properly and with sufficient frequency.

JOHN A. ROEBLING'S SONS CO.
Trenton, N. J. *Branches in Principal Cities*

ROEBLING
Wire Rope

CORRECT LUBRICATION:

1. *Reduces Rope Wear*
2. *Prevents Corrosion*
3. *Prolongs Rope Life*
4. *Lowers Operating Cost*
5. *Provides Greater Safety*

This advertisement is published in the interest of all wire rope users to help them obtain greater safety, service and efficiency from their wire rope.

Ask about **ROEBLING "BLUE CENTER" WIRE ROPE** *... either preformed or standard*

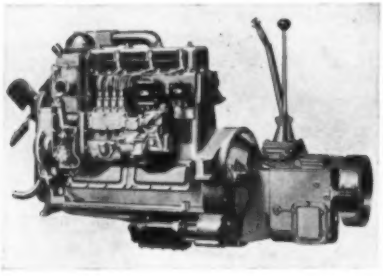
charging and discharging thereby saving the trouble of having no charging door to put on or off. Big, wide, rear charging hopper which serves as a receiving hopper for aggregates while charging, a stationary throw-back blade while mixing and at the same time affords visibility of sampling of the batch. "Hi-Discharge" can place concrete over 20 to 22 foot areas on all types of jobs. Gives added inches of discharge height needed to pour concrete directly into sidewalks, curbing, etc., from the street. Rex Quint-spout, which has fine chuting lengths and the Rex Zipper Spout suspension aid this high discharge.

Other new features include, enclosed anti-freeze water system, improved chain belt drive, twin clutch transmission and a man size inspection hatch, with removable doors, for drum inspection. Available in two, three, four and five yard sizes.

Caterpillar Model D312 engine

Manufacturer: Caterpillar Tractor Company, Peoria, Illinois.

Claims: Engine is a four stroke, valve-in-head, water cooled model with a bore of 4¼" and a stroke of 5½". Maximum horsepower



developed at 1,800 RPM, maximum torque of 193 lbs, ft. at 1,200 RPM. Piston displacement is 312 cu. inches. Block, cylinder head and crankcase unit are in cast alloy iron. Pistons are of aluminum alloy. Machine has fine main crankshaft bearings, with a total surface of 89.5 sq. inches and a crankshaft torsional vibration damper.

Water circulation is by pump, operating temperature of water thermostatically controlled. Air-cooled type lubricating oil cooler provided. Pressure lubrication is provided to all main and crank pin bearings, camshaft bearings, valve operating mechanism and timing gears.

Engine fuel system, manufactured by Caterpillar Tractor Company, has an individual pump and valve for each cylinder. Requires no adjustment in the field as the system is factory set. Model D312 is offered as a complete unit for replacement installations.

For further details about the equipment on this page please write to the manufacturer, mentioning Excavating Engineer.

Ideal carbon brush "concavor"

Manufacturer: Ideal Commutator Dresser Co., 4104 Park Avenue, Sycamore, Illinois.

Claims: This new device will

correctly form brushes to the commutator curvature. The old brush is used as a template to accurately locate the arc segment on the cutting guide seat, which arc corresponds to the contour of the commutator or slip ring. After this segment is found the new brushes may be formed without further set-up. Any electric drill or electrical shaft drive may be used to operate the cutting head. Complete unit includes aluminum guide castings, cutting file, removable angle plate with clamping device and "C" clamp. Takes practically any size brush for 4" to 48" diameter commutator.

Double bucket Carryall

Manufacturer: R. G. LeTourneau, Inc., Peoria, Illinois.

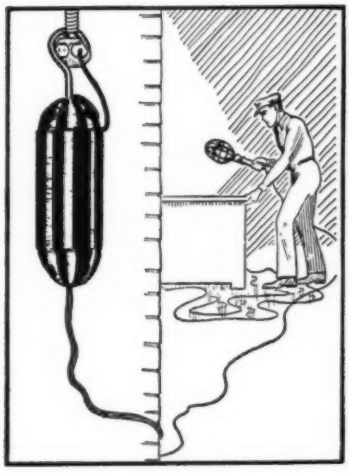
Claims: Struck capacity 15 and

a heaped capacity of 19 cu. yds. Can be used behind the standard D8 tractor and loaded either with or without a pusher. Adaptable either to long or short hauls. An 8 ft. 6 in. blade width permits the moving of the scraper over highways and its operation on narrow fills. Patented double bucket gives the effect of loading two small Carryalls successively. New apron design increases capacity, reduces overflow and facilitates loading by reducing entrance friction. Wipe-out ejection tailgate gives accurate control of spread and empties bowl completely. Cable is dead ended on the apron to keep sheaves entirely free from dirt. Convertible from a tractor drawn unit to one for use with the A Tournapull. May be equipped with a large variety of tire sizes.

Newark safety transformer

Manufacturer: Newark Transformer Company, Newark, New Jersey.

Claims: Designed to reduce deaths and accidents that occur in handling electric extension cords in wet and damp places. Its function is to lower any 110 or 115V current to the safe 6V. Provides for a 6V lamp using up to 50 watts.

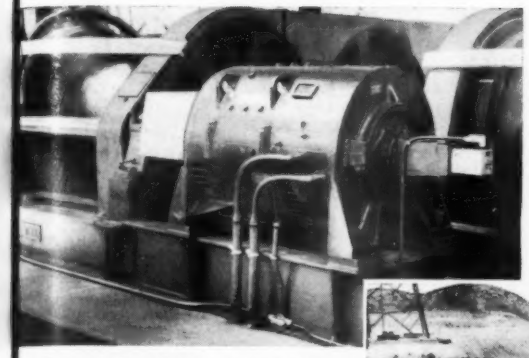


The unit is a light, small cylindrical device, the outer shell of which is made of non-corrosive, non-conductor and compound shell, enclosing a water proof transformer element. Case water and moisture tight.

To use, it is only necessary to plug one set of wires in any 110 or 115V receptacle, hang the device by its hook up on the BX receptacle or any other handy place or even permitting it to lie on its side on a table or floor.

BIGGER THAN BOULDER--

Starts to Rise



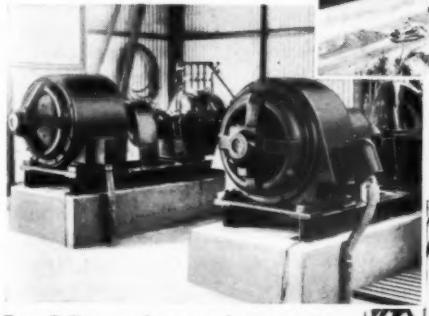
One of the three money-saving G-E 450-hp variable-voltage drives. By speeding up the return trip of the bucket, these drives reduce operating time by 17 seconds for each trip, and thus save thousands of dollars.

In the shadow of the huge cableway, the first of 750,000 eight-yard buckets was poured in July, 1940.

SHASTA DAM—largest unit in the $170,000,000 Central Valley Project—which will be the highest over-flow type dam in the world!

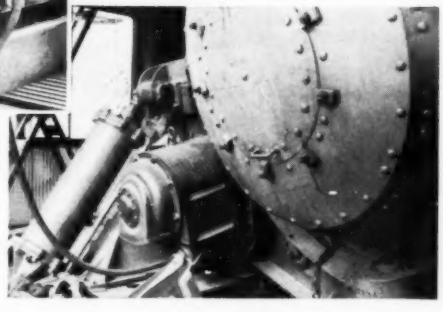
The building of this enormous dam is marked by several revolutionary developments. One is Columbia Construction Company's 9.6-mile conveyor system—the world's longest—to carry aggregate to the dam from Redding, Cal. Another is the use of one main tower for seven cableways—an ingenious method devised by the contractor, Pacific Constructors, Inc., to pour the six million yards of concrete needed. Both these money-saving innovations rely on properly applied G-E equipment for their success. All the main conveyor drives and the heaviest-capacity cableways are G-E equipped.

Without the right electric equipment, correctly designed and co-ordinated, it would be impossible to profitably carry out these vital construction projects. Before *you* start on *your* next job, why not call in our skilled engineers? They can help you, too, save days and dollars electrically. General Electric, Schenectady, N.Y.

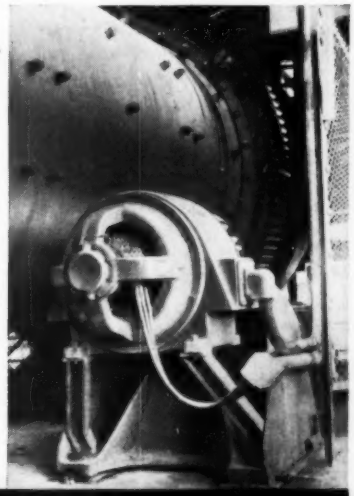


Two G-E squirrel-cage induction motors, each coupled to a centrifugal pump for forcing water to tanks high above the construction camp.

A G-E flange-mounted, splashproof induction motor, specially designed for this job, driving a concrete mixer.



A 200-hp G-E wound-rotor motor drives the tubular gravel scrubber through which will pass the gravel for the six miles of concrete. This is reported as being the world's largest single-unit motorized reducer.



GENERAL ELECTRIC

655-16

For your convenience in writing to General Electric Company, you will find a card bound in this issue.

NOT in the *Contract*

"I hear you've been to a school for stuttering. Did it cure you?"

"Peter Piper picked a peck of pickled peppers."

"Why, that's wonderful!"

"Yes, but it's h-h-hard to work into an ordinary c-c-conversation."

First Partner: The new stenographer's hair is decided blond, isn't it?

Second Partner: Yes, though I noticed a slight indecision around the roots.

Rastus: "Dey's a man outside who wants to see yo' about collectin' a bill. He wouldn't give me his name."

Boss: "What does he look like?"

Rastus: "He look lak yo' bettah pay it."

Then there's the chap who went spooning the other night with his sugar, and found there was nothing stirring.

Wife: The new maid has burned the bacon and eggs, darling. Wouldn't you be satisfied with a couple of kisses for breakfast?

Husband: Sure, bring her in.

The golfer lost his ball and, not unnaturally, was inclined to be annoyed with his caddy.

"Why didn't you watch where it went?" he asked.

"Well, sir," said the boy, "It don't usually go anywhere, and so it took me unprepared like."

Mose sat on his front porch munching cornbread when one of his hens went tearing past, followed by the old rooster in high gear. Suddenly the rooster applies his brakes, pulls up short, trots back and starts picking at the cornbread crumbs at Mose's feet. The old darky eyes him in astonishment then explodes, "Lan' sakes, Mr. Rooster, I hopes Ah never gets dat hungry!"

"If you don't hurry up, stupid, you'll find we ain't as superstitious as you seem to think!"

The Reverend Relents

The Reverend George Washington Hepzibah told his Deacons that he wanted every member of his colored flock to be present Sunday. "Sumbody done stole mah ovahcoat. Ah's gonna burn dey ears down. Ennybody ain't present is guilty."

Everyone was there—even down to Mose, the log turner. The Reverend started off with a bang—preached on "Thou Shalt Not Steal," "Thou Shalt Not Kill"—really burned them down to a crisp . . . suddenly, a lull, and then he changed to one of the sweetest sermons he had ever preached. His flock left puzzled. Deacon Brown went back and asked the Reverend why he changed so suddenly about someone stealing his overcoat. The Reverend said, " 'Member about dat 'Thou Shalt Not Steal'? 'Member about dat 'Thou Shalt Not Kill,' well when ah got down to dat Commandment 'bout Coveting Thy Neighbor's Wife, ah 'membered where mah overcoat wuz!"

"Waitress, what's wrong with these eggs?"

"I don't know, I just laid the table."

Teacher: Jakie, you'll have to do your writing lesson over again. Your "e" looks like "l".

Jakie: All right. But make Frankie do his again. His looks like hell, too.

The hired girl had been sent down to the brook to fetch a pail of water, but stood gazing at the flowing stream apparently lost in thought.

"What's she waiting for?" asked her mistress, who was watching.

"Dunno," wearily replied the master. "Perhaps she hasn't seen a pailful she likes yet."

"Did you knock on that traveling man's door and wake him as I told you to do?" inquired the boarding house lady.

"Yes'm," replied the new maid fresh from the country. "But he didn't wake up, so I finally had to go in and shake him."

"Good heavens, don't you know better than to ever go into a traveling salesman's room?"

"Yes'm," responded the new maid, "I do now!"

Correct rope reeving saves wire rope dollars . .

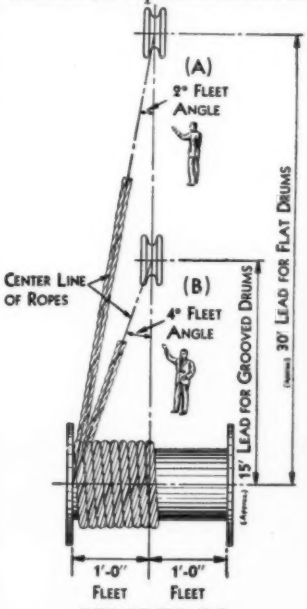
This is No. 6 in a series of informative articles for wire rope users prepared by the Macwhyte Wire Rope Company.

Avoid excessive fleet angles on your equipment

The fleet angle is that angle included between lines drawn from the center of the drum, and from the flange of the drum, to the lead (first) sheave. Both (a) and (b) below are illustrations of fleet angles.

Wire rope is often seriously damaged when this fleet angle is excessive. Side wear and severe scuffing result. Often individual wires become misplaced, bruised, crushed.

Grooved drums are damaged, too, by wide fleet angles. Ropes wear against the groove walls, grinding them down. Wear on the rope is excessive also.



WHAT TO DO

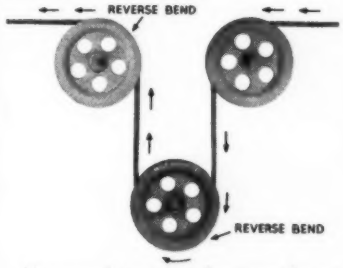
Check the fleet angles on your equipment. Keep the angle as small as possible. A fleet angle between 1° and 1½° is ideal. Fleet angles as low as ½° and up to 2° for flat faced drums and 4° for grooved drums are permissible for most hoisting equipment. If the fleet angle exceeds these values, then look out for excessive drum wear or poor spooling.

Guard against reverse bends

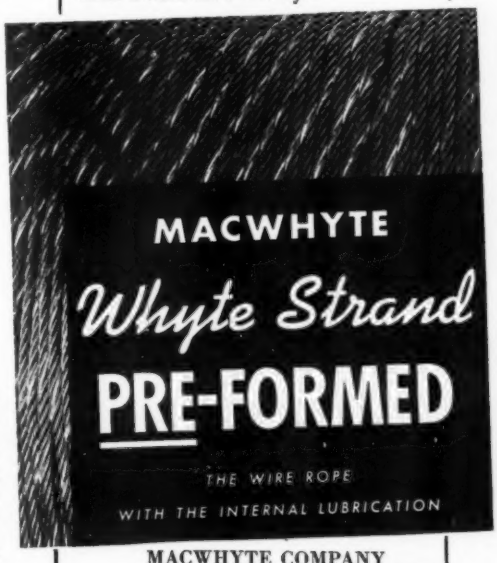
Years of experience and many tests have proved that reverse bending and excessive wire fatigue reduces rope life as much as 50%.

Where reverse bending cannot be eliminated, use the largest sheaves possible and place them as far apart as you can. By getting the MAXIMUM distance between reverse bends, you reduce fatigue—provide for longer service.

Keep sheaves aligned, too. Countless rope dollars have also been lost because sheaves are out of line.



You can detect misalignment by uneven groove wear. Keep sheaves in line. You'll save money.



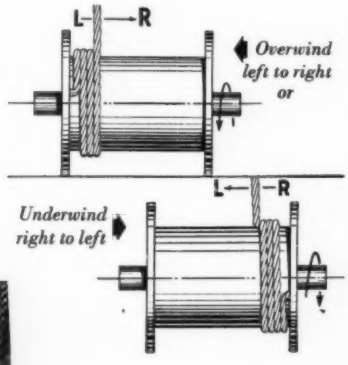
MACWHYTE COMPANY
2940 Fourteenth Avenue, Kenosha, Wisconsin
Manufacturers of rope wire—braided wire rope slings—Monel Metal and Stainless Steel wire rope—aircraft cable, tie-rods, and 'Safe-Lock' terminals for aircraft—and wire ropes for all requirements.
New York . . . Pittsburgh . . . Chicago . . . Ft. Worth . . . Portland . . . Seattle . . . San Francisco
DISTRIBUTORS THROUGHOUT THE U. S. A.

Steer clear of slip-shod spooling

Make sure the rope is wound on your drum in the *correct direction.* Rope wraps will then be close to each other and in line. Rope wear will be reduced to a minimum.

If rope is started in the *wrong direction,* however, uneven winding will result. Ropes cross and crush each other, causing a "burning" and scuffing of wires.

The following drawings show correct spooling for right lay rope when observer stands behind drum looking toward the direction of rope travel:



SEVERAL LAYER WINDING

There is usually considerable wear and scuffing against drum flanges when ropes change from one layer to the next. You can offset this condition in two different ways:

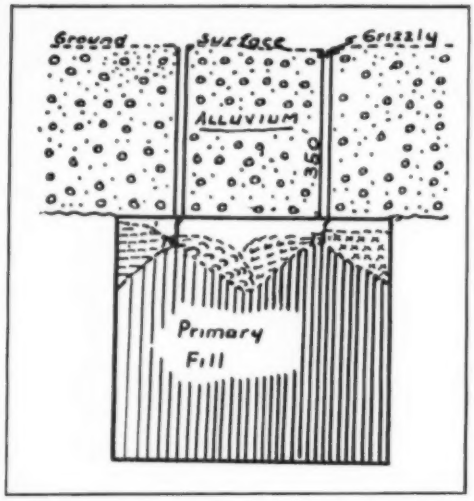
FIRST, and most effective, use rope of such length that there will be only one layer of winding; or when this is not possible . . .

SECOND, use a rope of MORE than sufficient length so that a short section can be cut from the drum end occasionally. This moves up the point of wear.

Previous articles in this series are available on request on your company letterhead, also G-13 general wire rope catalog containing much helpful information.

NO. 488

For your convenience in writing to Macwhyte Company, you will find a card bound in this issue.



• Cross-section sketch of stope filling operations. Fill pushed through the grizzly at the surface falls 350 feet to a stope where it is evenly distributed by a steel slide.

Death Valley Idea

(Continued from page 701)

alkali, hot and dry and fine as powder from parching in the desert heat. All of the material is sprinkled with water to prevent dust in the stopes.

In places where the location of the drilled hole falls in a low place, it is necessary to haul the material to the grizzly. A Caterpillar D7 tractor and a cable controlled LeTourneau Model L 6-yard scraper are used for this work. Hauls as a rule never run over 1,000 feet, and the tractor-scraper combination keeps plenty of material on hand to work down through the 350 foot hole. When the scraper is not being used to haul material to the holes under process of filling, it is kept busy stock piling material in low spots where future holes are contemplated.

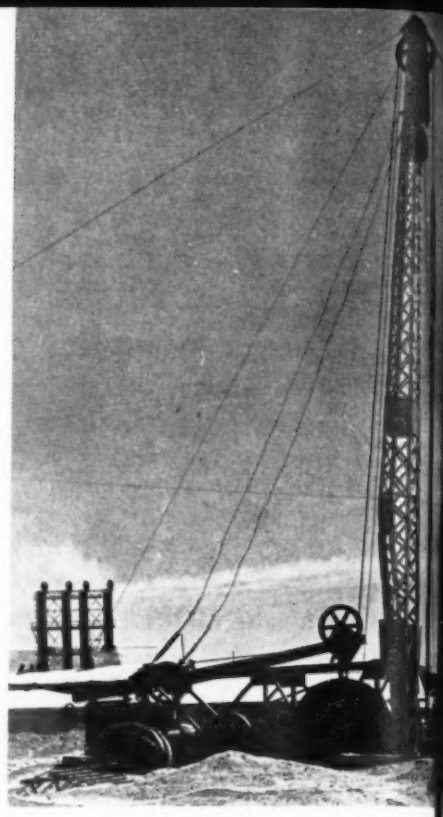
Of all the crews working at the boron mine, the drilling crew has about the hottest job of any. To all appearances, these men are constantly drilling holes on the floor of a monotonously rolling desert for no apparent reason. It takes more than a vivid imagination to visualize what is being accomplished down below. The mine crews working down deep in the ground are not bothered so much by the desert heat, which has been known to soar by day to 120 degrees Fahrenheit.

The sand and alkali running down through the deep hole into the stope block builds up naturally in the form of a cone, eventually reaching up to a point near the top of the stope chamber and leaving an unfilled space on either side of the mound, as shown in the accompanying diagram. Up on top of the ground, it would be a simple matter to level off the tops of the piles with the bulldozer, but in a borax mine you just don't keep a bulldozer handy down below to do such work. Neither do you expect the one you have working on top to be able to pull a Santa Claus act down through a 10-inch hole and get back up again. To level the cones off by hand is too expensive. Ordinarily, with such conditions, you'd have a problem on your hands. With a good organization on the job, the solution is easy.

Steel Slide Controls Pour

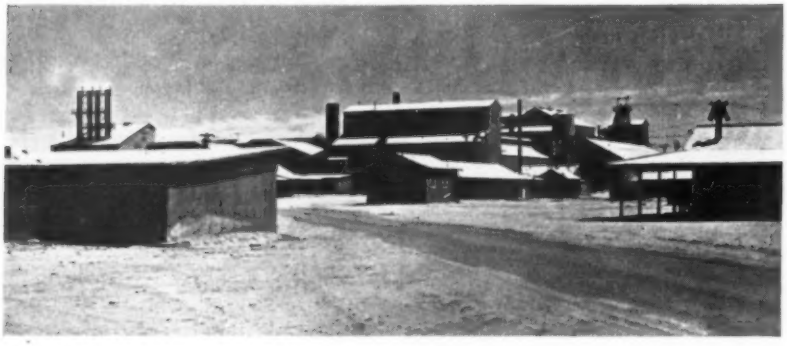
The men in charge soon designed a steel slide, built very much along the general lines of the steel slides so common to the average school playground. It is constructed in such a way that it can be taken down, carried through the stope raises and ventilation drifts and into tight places in the stope blocks and set up on top of the cone of earth formed by the primary fill. This slide is turned toward the unfilled part of the stope block and the backfill started again. The sand, dropping 350 feet, strikes the steel slide and shoots into place exactly where it should go to do the most good. About the only necessity to complete the backfill is a laborer's time now and then to turn the slide around so that it can again face an unfilled part of the block.

The work at the borax mine is under the supervision of Superintendent L. D. Osborne and is controlled from the Los Angeles office of the Pacific Coast Borax Company. This company, incidentally, is the sponsor of the radio program "Death Valley Days," heard over a national hookup, which presents stories of pioneering adventure in the early days of the valley.



• This old Armstrong 50 drill pioneered the unique stope filling idea at the Pacific Coast Borax Company mine.

• An air of peacefulness, belying the activity beneath the surface, pervades this view of the borax plant buildings.



WHO'S BOSS YOU OR THE WEATHER?

275,000 yards of earth and rock being moved during Spring thaw and rains by a fleet of "Caterpillar" Diesel D8 Tractors and Athey wagons. Relocation of State Highway 271, near Johnstown, Pennsylvania. Harrison Construction Co., Pittsburgh, had the contract.

CATERPILLAR

REG. U.S. PAT. OFF.

DIESEL ENGINES AND ELECTRIC SETS
TRACK-TYPE TRACTORS • ROAD MACHINERY

YOU DON'T need sunshine to make money when you're equipped with "Caterpillar" Diesel Tractors. Because here's power that can keep the yardage rolling — on its own hook — even along a hip-boot haul-road!

Long, broad-grousered tracks working with a careful balance between engine-horsepower and tractor-weight give "Caterpillar" Diesels enough stubborn pulling-drive to wade through on schedule—and wangle the load with them! Protective devices around the vital parts guard against water and grit. Easy maneuverability gives quick spotting under the shovel.

Get right down to the facts, and you'll find that "Caterpillar" Diesels are engineered to handle your work at a profit under just about any conditions you'll run up against. And on top of their weather-beating, load-moving power, you get a fuel-economy that cuts your costs by the hour—and a rugged dependability that means less down-time! See your nearest "Caterpillar" dealer or write direct to the factory for further information.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

Shots from the FIRING LINE

Renew New Jersey-Brooklyn Freight Tunnel Proposal

By Bethune Jones

A proposal for construction of a $60,000,000 to $70,000,000 union freight tunnel between Greenville, New Jersey, and Bay Ridge, Brooklyn, advanced originally in 1935 by the Port of New York Authority, is under consideration as a national defense requirement by New York Mayor La Guardia's advisory committee on port and terminals.

Rudolph Reimer of Brooklyn, member of the Port Authority and also a member of the mayor's committee, has urged the latter body to recommend to the mayor that he seek a Congressional appropriation for construction of a tunnel to provide a speedy rail link for movement of military supplies and armament between points in New England and the trunk line railroads using Greenville as a junction point.

It was announced that full details of the proposal would be submitted to members of the mayor's committee for study, so that action might be taken at an early meeting.

The tunnel would be about four miles long and its cost might run as high as $70,000,000, depending on whether it would be a single-track tube, as originally proposed, or a two-track road. The Greenville end of the tunnel, in the Hoboken section of New Jersey, would tap seven trunk line roads, including the Baltimore & Ohio, the New Jersey Central, the Delaware & Lackawanna and the Erie. At the Bay Ridge end the Long Island Railroad lines would be available to carry freight into the New England territory by way of the New York Connecting Railroad with its outlet over the Hell Gate Bridge.

Mr. Reimer told the committee that construction of the tunnel would save time and mileage, both important factors in time of war. Such a tube, he said, would be of tremendous value in moving anti-aircraft guns from the New England and Long Island coasts to points in New Jersey and nearby states.

The tunnel also virtually would end the lighterage of freight from New England, which now must be transported through New York harbor to Greenville and other New Jersey railheads. This method of transportation, according to Mr. Reimer, is unreliable and often slow, mainly because of harbor congestion, bad weather and fog conditions. The new tunnel would make possible direct shipments by rail from all industrial points in New England to the Greenville railhead, where they could be distributed through the lower Atlantic seaboard by the seven lines serving that point.

Texas Allots Highway Funds

The State of Texas has announced its customary annual provision of funds to cover the cost of maintaining the state highway system during the fiscal year beginning September 1, 1940, and ending August 31, 1941. Total appropriation made by the highway commission for regular maintenance was $7,668,356.75. This amount is to be distributed to the 25 field districts to cover the cost of roadway maintenance, bridge maintenance, center-striping, erection and maintenance of highway signs, etc.

This appropriation for regular highway maintenance represents a reduction of about 10 per cent in comparison with the state-wide maintenance budget of last year. The highway department announces that with its limited revenues very slow progress is being made in the completion of the Texas highway system and the closing of the many unsurfaced gaps over the state. Highway officials voluntarily decided this year to reduce the regular maintenance expenditures approximately 10 per cent in order that the savings of approximately $784,773.49 derived from such reduction might be used in the completion of the much needed improvements to the riding surface of existing highways and the surfacing of gaps in the system. This is being done since it is known that the requirements of the new act of the national congress will place practically all of the federal funds available to the state highway department on the roads designated as being of strategic military importance by the War Department. For this reason all available state highway funds will be necessary to carry on the needed work on the majority of mileage of highways in the state that will not be considered a part of the strategic military network.

Are You Going?

New York City will be invaded on January 27, 1941. A large and imposing army of road builders will take over and occupy Manhattan for five action-packed days when the American Road Builders' Association meets for its 38th annual Convention. Conventionites, enlisted for the duration of the war on obsolete highways, will be provided with abundant ammunition for continuing the campaign. Although it will be a peaceful army, its parleys will strike a militaristic note, since "Roads for Defense" will be convention theme note.

Opening gun in 1941's battle for highway preparedness will be fired at the convention's roads-for-defense forum. Highway and military experts will join federal and local government officials in discussing the value of highways to national defense. They will exchange

● **Completion of excavation work marks the beginning of concrete placing operations at California's Shasta Dam. Note the covered aggregate conveyor belt running from the storage plant at the left to the mixing plant at the base of the head tower, right.**

MONEY SAVING *Accessories*

Blocks and Linings

Beco Blocks and Linings take the heavy loads at the increased speeds demanded of modern excavating equipment. These Beco products are durable and tough — that's why replacements and adjustments are less frequent.

Rope Sockets

Bulldog wedge rope sockets never fail. The harder the pull . . . the tighter the grip! Attachment is easy and quick and directly in line with pull, eliminating costly kinks. Made in a dozen sizes and four different styles. Write for bulletin.

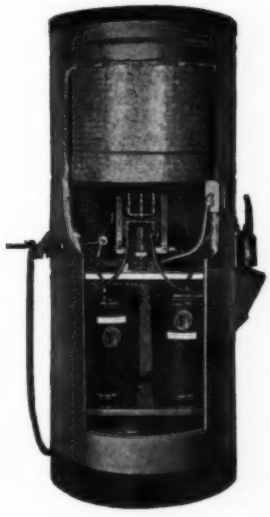
Wire Rope

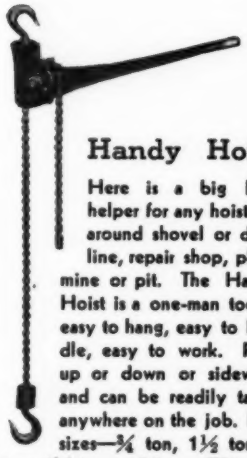
Selected by the men who build your excavating and drilling machinery, Bucyrus-Erie rope has the special features that spell better performance. B-E wire rope has a uniform high quality, and comes in the right sizes, types, and construction for your exact needs. Send for wire rope bulletin.

New Bucyrus Oil Reclaimer

With the NEW Bucyrus Oil Reclaimer, used oil is reclaimed by a simple washing and filtering process at an average cost of about nine cents per gallon. It is a scientific fact, arrived at by leading research engineers and chemists throughout the country, that engine-use breaks down only the weaker and unstable molecules of your oil. These constitute about 10 per cent of the oil—the other 90 per cent, the strongest particles of the original oil can be separated and cleaned for re-use by the NEW Bucyrus Oil Reclaimer.

Investigate the possibilities of the Bucyrus Oil Reclaimer before you discard another quart of used oil.





Handy Hoist

Here is a big little helper for any hoist job around shovel or dragline, repair shop, plant, mine or pit. The Handy Hoist is a one-man tool—easy to hang, easy to handle, easy to work. Pulls up or down or sidewise, and can be readily taken anywhere on the job. Five sizes—¾ ton, 1½ ton, 3 ton, 4½ ton, and 6 ton. Write or descriptive literature.

Push-Pull Jack

No matter how unusual your "push, pull, clamp, or straightening" problem may be, BECO Jack is the tool that gives you a safe, sure, and proved means of doing the job better. Screw lengths—10″ 12″, 14″ 16″ and 18″. Capacity 35,000 lbs. Send for bulletin.

Red Arch Chain

New Red Arch incandescent butt welded dragline chain has twice the strength and wearability of ordinary chain. It will save you extra money because of less shutdown time. You can get any size chain from ⅝″ to 1½″ to fit your bucket. Write for complete story.

T-87

BUCYRUS-ERIE

EXCAVATING, DRILLING, AND MATERIAL-HANDLING EQUIPMENT . . . SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

• Top, left: R. T. Lingle, superintendent of plant and operations for the Lake Worth Drainage District. Top, right: Specially constructed "weed rake" bucket used for canal cleanout operations. Bottom: The district's ½-yard Northwest dragline excavates a six-foot ditch through typical muck land.

ideas and recommendations on the improvements required to make America's roads meet preparedness needs. Representatives of the U. S. War Department and the National Advisory Defense Commission will be on hand for these deliberations.

Roads for defense will also be stressed at other sessions which follow the opening day forum. General sessions will be interspersed with special meetings of the Municipal, County Highway Officials', Contractors', Airport, Manufacturers' Planning, Highway Economics, Educational, Pan-American and Public Relations Divisions. The Pennsylvania hotel will serve as convention headquarters.

While entertainment will be the keynote at the annual banquet at the Waldorf-Astoria, January 29, this celebration will also be patriotic in theme. The entertainment will surpass that produced at any former Road Builders' conclave and will be of a quality seldom equalled by other conventions. Arrangements are being made to secure the appearances of leading radio and movie stars.

Topics of particular interest to contractors will be discussed at "contractors' clinics." On the agenda for discussion at these meetings are diversion, federal regulation of wages and hours, ways to reduce compensation payments, depreciation and rental schedules for equipment, city street maintenance by contract, WPA contracts, bidding pitfalls and reduction of overhead through adequate records.

Special addresses for county officials, ARBA Airport Division conference, and technical clinics for state highway officials and engineers assure a worthwhile experience for every one attending the convention.

Visit to Florida Drainage District

Rehabilitation of land and maintenance of irrigation and drainage systems are important operations in a state that produces fruits and fresh vegetables the year around.

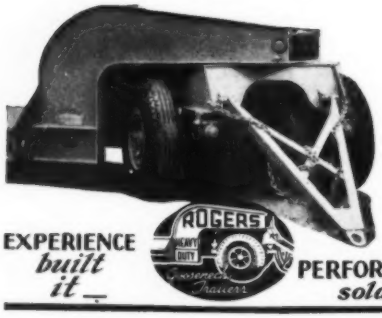
The Lake Worth Drainage District is typical of Florida's organized land rehabilitation districts. Like many other districts, the Lake Worth organization depends on the services of modern dirt moving equipment to carry out its services.

The district is at present operating three dragline machines; a ½-yard Northwest, a ½-yard P&H, and a ¾-yard P&H.

These draglines are converted into highly mobile units by the use of a 15-ton, single purpose Jahn dragline trailer. With this trailer, machines are loaded, carried to their objective, dismounted and started to work on a new job within a half day anywhere within the district's scope of action, which covers 123,000 acres, or 208 square miles of land. Within this district are 500 miles of east and west laterals and north and south equalizing canals, of which 231 miles are being fully and actively maintained. These canals range in bottom width from six feet to a hundred feet.

The main duty of the dragline machines is to serve as the chief maintenance equipment in keeping existing ditches clear of water hyacinths and other obstructive aquatic growth, in-

"others were replaced ONCE A MONTH but ROGERS BRAKES ARE GOOD AFTER A YEAR"



YES, Rogers Brakes are exceptional, as indicated by the above frank statement of Byron R. De Witt, well known moving contractor of Pavilion, N. Y.

Exceptional also is the painstaking attention given to every detail of Rogers Trailers — to refinement of design — to ingenious construction — to ease and economy of operation — long service with freedom from repairs.

There is a size and type to serve you in your particular operations. Write for information.

EXPERIENCE built it — PERFORMANCE sold it —

ROGERS BROTHERS CORPORATION
136 Orchard St. Albion, Penna.

For your convenience in writing to Rogers Brothers Corporation, you will find a card bound in this issue.

cluding deepening made necessary because of formation of sandbars. During the past 18 months these machines, along with two ¾-yard Northwests, operated by Harvel Brothers Construction Company of Delray Beach, Florida, and one model 20-B Bucyrus-Erie dragline, operated by Clint Moore, of Delray Beach, have been mainly active in assisting in the completion of a ditch-cleaning and deepening, and water control building program, made possible by a $168,000 loan from the Reconstruction Finance Company early in 1939.

New ditch work usually tackled by the machines consists of cuts made in sandy loam soil. However, in frequent instances, a three to six-foot layer of hard, marl-like soil is encountered which offers the same resistance as northern clay. Also occasional outcroppings of rock necessitate blasting and handling of rock by the machines.

Greater efficiency in moving water hyacinths in dragline cleaning jobs in The Lake Worth District's canals has been achieved by use of a special canal "weed rake" bucket, manufactured by the Vero Machine & Supply Shop, of Vero Beach, Florida. This bucket, wider and shallower than ordinary digging buckets, is equipped with widely spaced vertical steel bars at the back, which allows water and sludge to slip out, permitting a full load of hyacinths to be drawn in.

Another important function of the district's dragline machines has been the excavation of pits and the throwing up of dams in canals preparatory to the installation of large water controls and pumping stations. Two 20,000 gallon per minute Storey-Stewart pumping units, powered by two P.D. 80 International diesel motors have been recently installed. The Lake Worth Drainage District is both a drainage and irrigation district, and possesses seven pumps of its own, and other makes, all powered by International motors.

Other heavy equipment possessed by the district includes one T-20 International tractor, equipped with a Bucyrus-Erie bullgrader. This piece of equipment has been particularly useful in transporting heavy supplies through woodlands to water control jobs. At present it is equipped to serve as a pumping unit, a road grader, or as simply a power instrument when trucks fail.

In addition to the dragline machines and bullgrader mentioned, the district maintains a fleet of twelve trucks and cars to carry on its maintenance and rehabilitation programs, and has a fully equipped machine shop, with storage facilities for fuel and machinery.

Active management and supervision of Lake Worth Drainage District is composed of H. E. Motter, general manager, and R. T. Lingle, superintendent of plant and operations. A board of supervisors, composed of Max H. C. Brombacher, M. A. Weaver, and R. V. Jones, meets once a month to review reports of progress and approve policies of action.

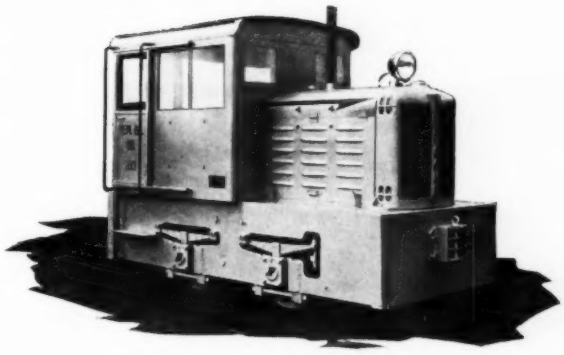
Concrete Industries to Convene

Inviting the construction industry to "Come See How It's Done in '41," the 1941 Concrete Industries Exposition announces its bi-annual activities will be held in Chicago at the Sherman Hotel on February 10, 11 and 12.

The Exposition is again to be held concurrently with the annual conventions of the National Concrete Masonry Association, the American Concrete Contractors Association, the National Cinder Concrete Products Association, the Cast Stone Institute and the American Concrete Pipe Association. Since the Road Show and the Concrete Industries Exposition are now held in alternate years, the latter will be the only major equipment show for 1941.

Coincident with the setting of the Exposition dates, E. J. Goes of the Koehring Company was named as chairman of the manufacturers' publicity committee, which has been formed to promote attendance. Also named to this committee are: G. H. Pfeifer, Chain Belt Company; A. J. Gerlach, Paulson-

Haulage Economy
DEMANDS
Efficient Equipment



WHETHER you are switching standard freight cars or hauling materials, you want abundant, easily-controlled power that operates with economy. Whitcomb Locomotives have been making low-cost haulage records in scores of industries for over thirty-five years where the highest efficiency and economy are paramount requirements. Their rugged, simple construction insures long life with peak performance — yet low maintenance costs.

In the Whitcomb line there is a size and type to suit every job. Let us give you more details . . . you will discover exactly what you have wanted for your service.

WRITE FOR FULL PARTICULARS. NO OBLIGATION.

BLW THE BALDWIN GROUP

THE WHITCOMB LOCOMOTIVE CO.

ROCHELLE, ILL.

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

For your convenience in writing to The Whitcomb Locomotive Company, you will find a card bound in this issue.

• Clay County, Missouri, uses its International - mounted Bucyrus-Erie bullgrader to cut a secondary road through heavy clay hills.

Gerlach & Associates; G. A. Loveall, Construction Machinery Company; L. L. Jacobs, The Buchen Company; J. J. Buzzell, Besser Manufacturing Company; R. Marshall, Stearns Manufacturing Company; T. J. Harris, J. R. Hamilton Advertising Agency; Roy N. McCandless, National Contractors Masonry Association; Bert Carey, American Concrete Contractors Association; and Louis Brookman, Jr., Concrete Industries Exposition.

Clay County, Missouri Road Job

By Kenneth Force

As they approach the junction of the Kaw and Missouri rivers from the North and East, the rolling hills of Missouri create a beautiful and rugged landscape. But they also make a tough job out of road building in Clay County.

About two miles east and one mile south of the county seat, Liberty is a 13,350 foot road running north and south that a short time ago was one of the roughest in Western Missouri. This stretch of roadway runs over hogbacks, around hills, through narrow cuts and in all, from beginning to end, negotiates 10 hills.

Recent county modernization of this road includes: lowering of ridges, widening of the narrow roadbed between cuts, and straightening of the road in general.

Work on the last, and roughest, stretch of the road illustrates best the wide variety of obstacles the Clay County engineering staff had to overcome, and is pictured here.

The last stretch was 1,200 feet long, a narrow roadway between banks of clay rising sheer on each side from 10 to 20 feet high. Under Gilbert Denny, county engineer, and S. G. Laffoon, assistant, the county used a Bucyrus-Erie bullgrader for the tough work on this section, as well as on three of the worst hills along the road elsewhere. Engineer Denny figures that his use of the International-mounted Bucyrus-Erie Bullgrader saved him the expense of employing power shovel equipment.

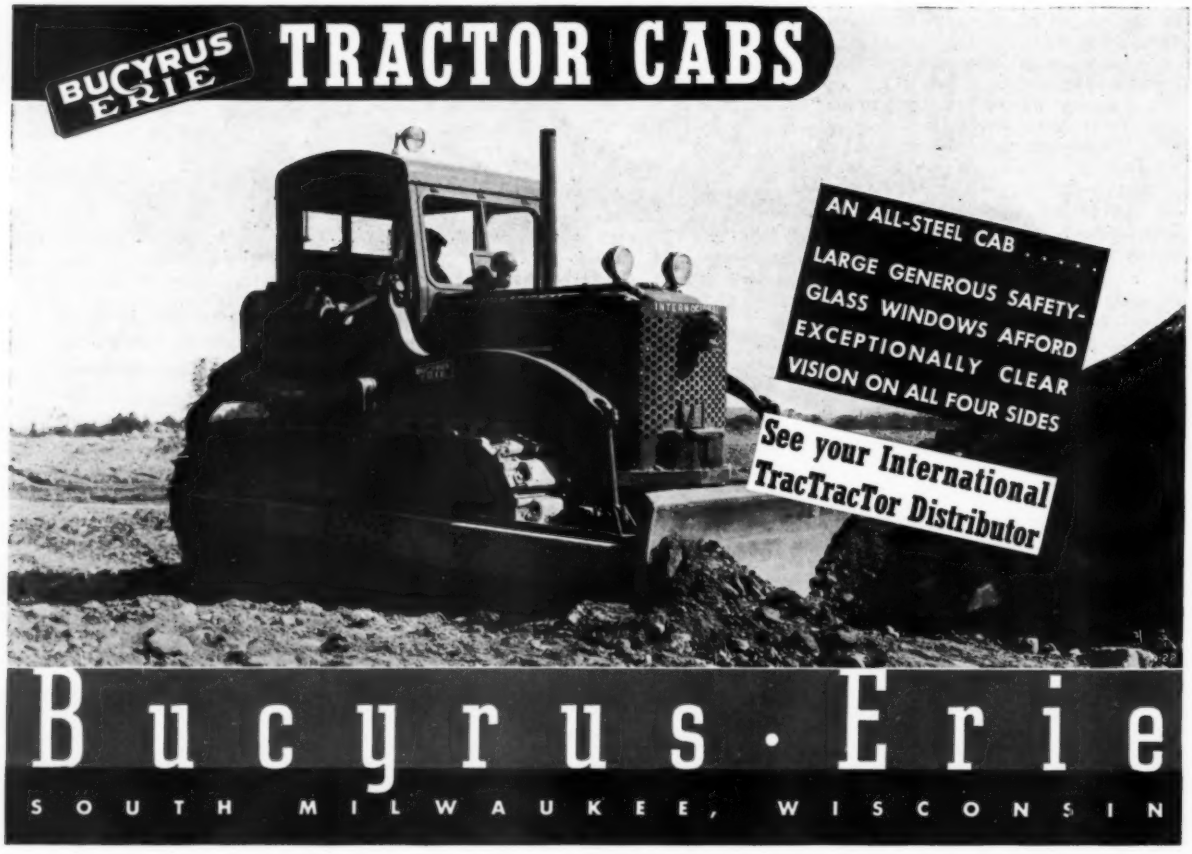
On the toughest segment on the road, the tractor used 15.7 gallons of fuel in an 8-hour operation. As is customary, the county changed oil (four gallons) every 56 hours, or every seven 8-hour days.

Young Leaves for New Post

Walker R. Young, supervising engineer of the Central Valley Project, left Sacramento in November for Denver, Colorado, to take over his new post as assistant chief engineer of the United States Bureau of Reclamation.

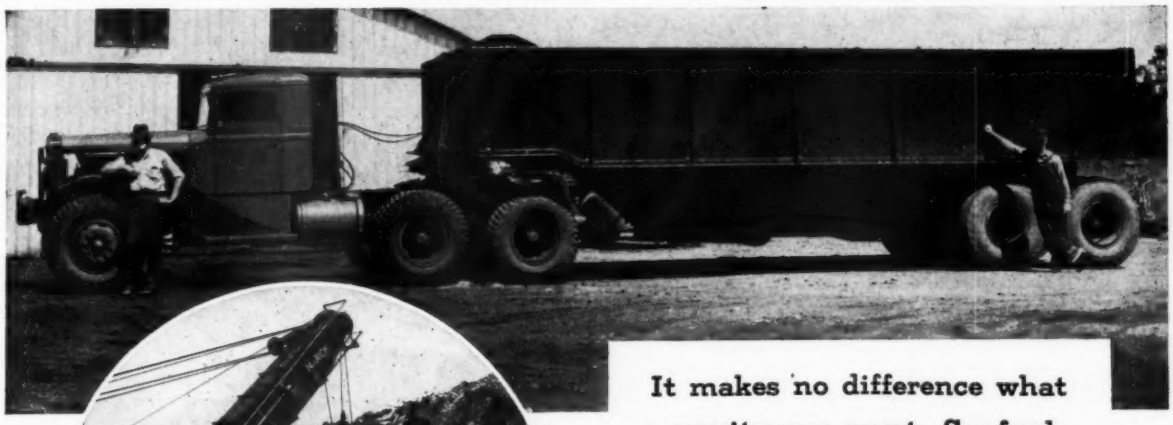
Simultaneously Chief Engineer S. O. Harper announced from Denver the designation of R. S. Calland, who has been assistant supervising engineer under Mr. Young, to serve as acting supervising engineer in general charge of project activities in California pending the permanent appointment of a successor to Mr. Young. Mr. Calland's headquarters will continue to be in the Old Post Office Building, Seventh and K Streets, Sacramento.

Mr. Young's appointment as as-


BUCYRUS ERIE
TRACTOR CABS
AN ALL-STEEL CAB . . . . .
LARGE GENEROUS SAFETY-GLASS WINDOWS AFFORD EXCEPTIONALLY CLEAR VISION ON ALL FOUR SIDES
See your International TracTracTor Distributor
Bucyrus·Erie
SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

Is It BIG CAPACITY Trailers You Want?



It makes no difference what capacity you want. Sanford-Day will build them to meet your requirements — from 6 tons up . . . and with advantages that only Sanford-Day can offer you.

● S-D "Automatic" Trailers mean savings to you where the greatest of savings are possible. Check up on your haulage and dumping cost. Check especially on your cost of dumping, for S-D Trailers are "Automatic"; and, in addition, the simplest, fastest, most fool-proof and economical trailer you can use.

Here is the trailer that eliminates all auxiliarly powered dumping mechanisms—Result: simplicity and low upkeep expense! Sanford-Day's nationally known mine car principle of automatic bottom discharge is the feature of this trailer. Doors are tripped and closed automatically by the simple forward movement of the trailer. No manual labor whatsoever. With a continuous circuit of hauling—never stopping when discharging . . . with the maximum capacity available for given over-all dimensions . . . with doors swinging below top of bin when in discharge position, permitting a very low center of gravity and extreme low over-all height, S-D Automatic Bottom Discharge Trailers will save time . . . at production speeds you never thought possible. Built for Strip Mines, Cement, Sand, Gravel, and other operations, in capacities to suit your individual requirements. Clip the convenient memo at right and mail NOW.

MAIL THIS MEMO NOW

Sanford-Day Iron Works,
4120 Dale Ave., Knoxville, Tenn.

Furnish us with your completely illustrated "Increase Production—Lower Cost" Bulletin No. 1255 on the S-D Automatic Bottom Discharge Trailer.

Firm .....

Address .....

City..... State.....

By..... Title.....

SANFORD-DAY IRON WORKS 4120 Dale Ave., Knoxville, Tenn., U.S.A.

MINE CARS, ALL TYPES • TRAILERS • WHEELS • SHEAVES

When writing to Sanford-Day Iron Works, use coupon or card bound in this issue.

sistant chief engineer was announced on October 16 by Secretary of the Interior Harold L. Ickes. He had been in charge of the Central Valley Project for five years, having come to Sacramento in October 1935 from Boulder Dam where he was construction engineer. He has been with the Bureau of Reclamation since 1911.

Mr. Calland also served on the engineering staff at Boulder Dam, being transferred to the Central Valley Project office in Sacramento in January 1937. He has been with the Bureau of Reclamation a total of 17 years.

Government Plans to Excavate Grand Coulee Slide Area

By G. Kirkpatrick

The time for calling bids for removing overburden would seem to have passed at Grand Coulee where the great rising structure of the big dam on the Columbia River is approaching completion.

However, to settle a nagging trouble, the United States Bureau of Reclamation is planning the removal of 1,250,000 cubic yards of earth and 50,000 cubic yards of rock to put an end to a slide along the west bank of the river. This has been a source of grief since 1933.

The slide area is downstream from Grand Coulee dam itself and has not affected the structure. However, it does do damage to the highway and the railroad leading to the town of the government engineers. During 1933, when David Ryan held the contract for the removal of the overburden, there was a previous slide of about a million cubic yards. Continually since then, the area has been a source of trouble with slides coming intermittently. Engineers have driven tunnels into the hill with the object of draining the area, but without success in arresting the earth movement.

• View of the almost completed Grand Coulee Dam. Light, triangular patch in background indicates location of recent slides which imperil the railroad and highway located below. (Bureau of Reclamation Photo)

It is estimated the job will amount to about $500,000. Removal of the sliding earth, which moves on underground layers of wet clay, will open up a deep bay in the solid rock downstream from the dam. The railroad and highway will have to be relocated. The slide area is about 1,400 feet wide.

Massachusetts Defense Highways

A list of 28 major Massachusetts highway projects which will bring 500 miles of Massachusetts highways up to defense requirements of the United States Army, has been announced by Public Works Commissioner John W. Beal.

The total cost of the work, start on which must await provision of funds by Congress, will amount to nearly $57,000,000 of which $39,550,000 will be spent for construction, $2,865,000 for land damages on 250 miles of highway including six bridges; $13,000,000 for construction and $1,000,000 for land damages, in widening and building shoulders on an additional 250 miles of strategic roads.

Commissioner Beal revealed that Routes 5, 20, 1 and 3 are considered by the Army as of first importance for strategic highways and that Route 2, the Mohawk Trail, is second in importance.

Construction of a four-lane, divided road between North Wilbraham and the intersection of Route 9, the so-called Worcester Turnpike, and Route 20 in Northboro, a distance of approximately

A Haiss Bucket is a Crane Man's Delight

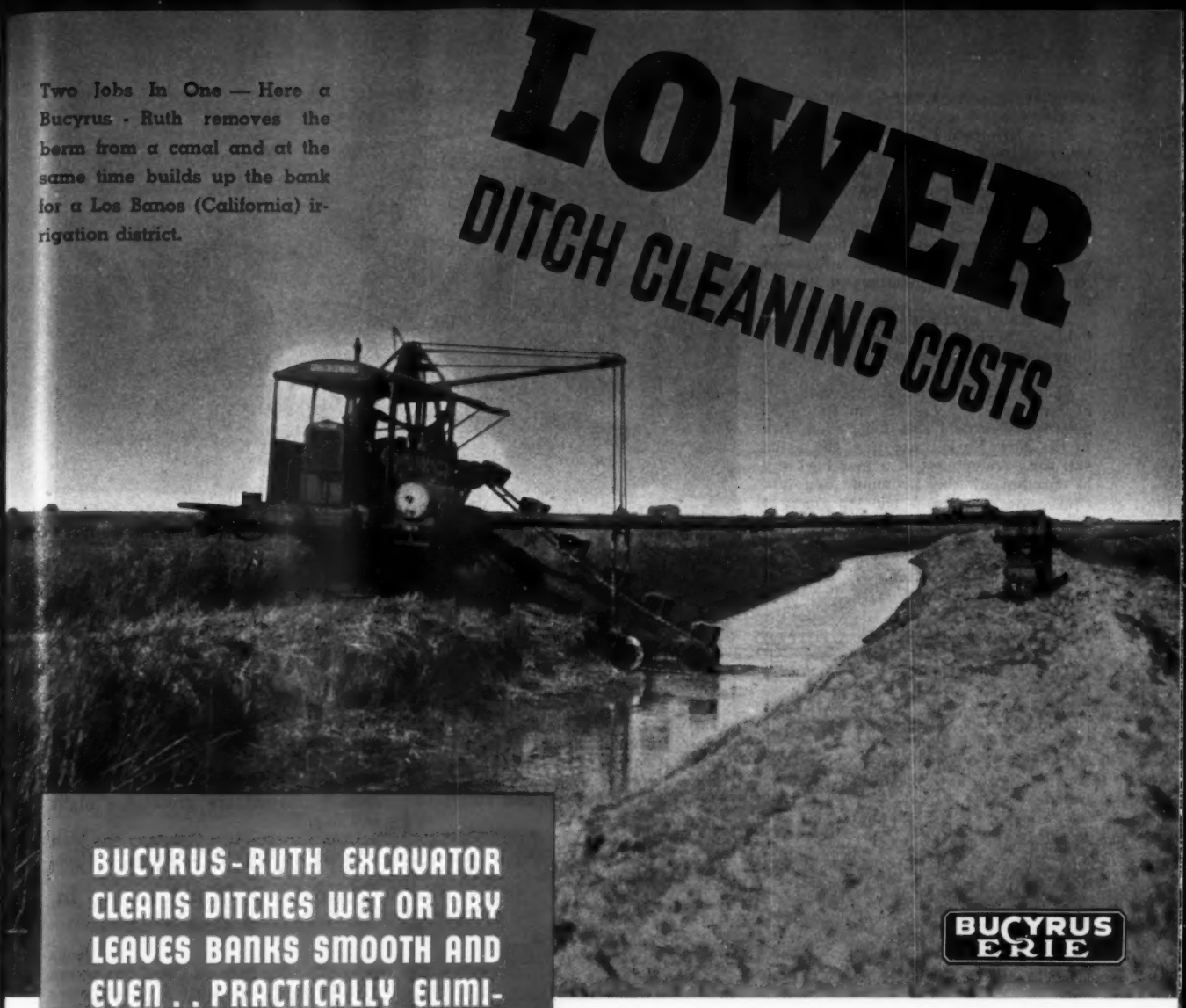
Power to grab and "rassel" a boulder out of sticky clay.... Power to dig in any ground.... Power in its closing gear, power in its jaws and teeth, power in its Haiss-design. Write or wire for prices. All sizes.

HAISS
Hi-Power
FOR PAY LOAD CLAMSHELL DIGGING

In stock at New York, Philadelphia, Baltimore, Birmingham, Atlanta, Hartford, Harrisburg and Los Angeles
GEORGE HAISS MFG. CO. INC., 144th ST. & PARK AVE., NEW YORK — DISTRIBUTORS EVERYWHERE

For your convenience in writing to George Haiss Mfg. Co., Inc., you will find a card bound in this issue.

LOWER DITCH CLEANING COSTS



Two Jobs In One — Here a Bucyrus - Ruth removes the berm from a canal and at the same time builds up the bank for a Los Banos (California) irrigation district.

BUCYRUS-RUTH EXCAVATOR CLEANS DITCHES WET OR DRY LEAVES BANKS SMOOTH AND EVEN . . PRACTICALLY ELIMINATES COSTLY HAND LABOR.

The Bucyrus-Ruth cleans ditches whether wet or dry—no need to shut off water. Handles silt, sand, clay, gumbo, loam, gravel, rank tule growths, bamboo and even small willows. It has a low ground pressure . . . moves ahead constantly while digging, thus is always moving onto fresh ground—practically no chance to settle. Banks are left smooth, and even, with a uniform cross-section that increases flow and reduces seepage and evaporation loss. The Bucyrus-Ruth readily clears gates, checks and similar structures . . . works close to fences and poles . . . does a finished job—no hand trimming necessary. Hundreds now in use by irrigation and reclamation districts the world over.

Lower your district's irrigation costs. Write today for full details—find out NOW how the Bucyrus-Ruth can save you money cleaning and constructing canals and laterals. Bucyrus-Erie also offers a complete line of caterpillar-mounted draglines, from ⅜-yard capacity up.

Bucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN

EXCAVATING, DRILLING AND MATERIAL HANDLING EQUIPMENT

45 miles, is perhaps the largest project contemplated.

From Brimfield to North Wilbraham, the road will be relocated to by-pass Palmer. Between North Wilbraham and Springfield, the present highway will be widened to four lanes.

When the work is completed, there will be a modern four or six-lane highway the 85-mile distance between Brookline outside of Boston and Springfield.

The bridge over Little River in Westfield will have to be replaced, according to present plans, because of insufficient capacity.

Shoulders at 4,000-foot intervals will be built where necessary on Route 20 between Westfield and Lee. From Lee to the New York State line, the plans call for development of a new highway to circumvent the Lebanon Mountain route and provide a shorter road to Albany.

Route between Springfield, Greenfield and Bernardston will also be improved either by construction of four-lane highways or construction of shoulders.

Madera Canal Work Started

The signal for work to start on another feature of the Central Valley Project has been given by the United States Bureau of Reclamation which issued an official notice to the Utah Construction Company to proceed with construction of part of the Madera Canal.

• The traditional spade is displaced by an Allis-Chalmers tractor equipped with a Baker bulldozer during ground breaking ceremonies for a $37,000,000 Wright aircraft engine factory near Cincinnati. On the tractor are (L to R) Brigadier General O. P. Echols; Emil Schram, RFC chairman; and Guy W. Vaughan, president, Curtiss-Wright Corporation.

First project canal work in the San Joaquin Valley, the $397,963 contract calls for building 8½ miles of concrete-lined canal from a point 600 feet west of Friant Dam on the north side of the San Joaquin River Canyon, to the vicinity of the Fresno-Yosemite Highway in the foothills of east Madera. The initial 600 feet of the canal will be built by the Griffith Company & Bent Company, general contractor on Friant Dam, where final excavation and early concrete placement are proceeding night and day.

Utah Construction Company has been allowed 500 days to complete the job.

Third Lock Construction in Panama Canal Zone

Work on all fronts of the third locks project at the Panama Canal has shown rapid and satisfactory progress since the first actual work was begun July 1, according to Lt. Col. Thomas B. Larkin, supervising engineer.

Excavation is proceeding on the Pacific side by-pass channel to the new Miraflores Locks; ground along the route of the Atlantic side by-pass channel has been cleared and dredging operations are to begin there within a few days; clearing has been started at the Gatun Lock site and dump areas, preparatory to asking for bids for the dry excavation; final designs are now being made for the movable bridge across Miraflores Locks and the approach trestles; the relocation of various utilities in construction area has been started; engineering plans and designs are being rushed; and the recruitment of new workers and the construction of living quarters for them is being rapidly advanced.

Wet excavation for the by-pass channel to the new Miraflores Locks was begun on the first day of this fiscal year when the dipper dredge Cascadas scooped the first bucketful of mud from the channel. Since that time the dredging division's equipment has removed more than a half million cubic yards of

Make tough excavating jobs easy!

On thousands of dig-and-haul jobs all over the world, SAUERMAN Machines have shown how to simplify operations and cut costs.

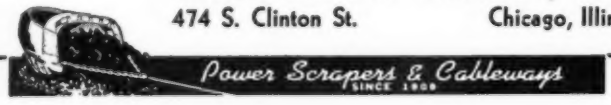
Above is a typical example. A SAUERMAN Scraper, with the scraper hoist mounted on a skid-frame, drags gravel from an island in the middle of a wide river and builds a compact, sloping revetment to repair deep erosions in the river-bank. Over a million cubic yards of fill were required at some thirty different locations along the river, and the work had to be completed in less than two months to beat the autumn rains. Twelve SAUERMAN Scrapers were used by three contractors on the different sections. The section shown in the picture, totalling 14,500 cu. yd., was completed in six days by the 3 cu. yd. scraper—quite a record considering that untrained labor was recruited from relief rolls to operate the machine.

Because SAUERMAN Scrapers and Cableways are really long range (100 to 1500 ft. working spans), they will handle a multitude of jobs impossible with other equipment. They require only one operator, and are extremely low in power consumption.

Write for Catalog today!

SAUERMAN BROS., Inc.

474 S. Clinton St. Chicago, Illinois



For your convenience in writing to Sauerman Bros., Inc., you will find a card bound in this issue.

material. At the present time the dipper dredge Gamboa and a drillboat are being used in the work. Later a suction dredge will be added.

On the Atlantic side, the 24-inch suction dredge Las Cruces will soon be moved to the point in the Canal channel where the by-pass channel will connect it with the new Gatun Locks and begin wet excavation there. It is planned to use a suction dredge on the Atlantic side by-pass channel for five months during this fiscal year and $300,000 has been set aside for this work.

Most of the material from the approach channels will be removed by floating equipment of the dredging division, which is to be later augmented by about $2,500,000 worth of additional equipment. Excavation of the lock sites proper will be done in the dry and under contract.

Early in September municipal engineering division forces began the work of clearing the Gatun Lock site and dump areas to afford prospective bidders on the dry excavation work an opportunity to inspect the sites. Subsurface investigations for the new Gatun Locks is sufficiently advanced to determine the amount and quantity of material to be excavated.

Preliminary plans for the movable bridge over Miraflores Locks submitted by the engineering firm of Sverdrup & Parcel, of St. Louis, have been approved, and final designs are now in the course of preparation. Sverdrup & Parcel was awarded the contract to prepare designs and specifications for the bridge.

Designs and specifications for the structural steel aproaches are being prepared by canal engineers under the direction of Allston Dana, designing engineer of several of the large bridges in New York. The general scheme for the approach trestles has been approved and Mr. Dana and his assistants are now engaged in making final designs.

In the course of the third locks construction work much previous construction must be readjusted. A number of structures and utilities along the route of the by-pass channels and new locks must be moved. Two of the most important of these are the Panama Railroad between Quebrancha and Mount Hope and the Agua Clara waterworks on the Atlantic side. Plans for the relocation of the Panama Railroad and the replacement of the Agua Clara plant are being made. The relocation of the railroad will cost $700,000, and the new line will cut across from Quebrancha to a point near Mindi River bridge, a route two and a half miles shorter than the present line.

Work on the third locks project will require the service of a greatly increased Panama Canal personnel, especially for engineering work. The recruitment of needed personnel has been in progress now for some time and Major Hans Kramer, assistant supervising engineer of the special engineering division, is now in the United States for the purpose of personally interviewing men capable of holding key positions in the work to come.

Federal Aid and Defense Highways

Improvement of highways for defense purposes is provided for in the new Federal Aid Bill (H.R. 9575), recently signed by President Roosevelt, as follows:

"In approving federal aid highway projects to be carried out with any unobligated funds apportioned to any state, the commissioner of public roads may give priority of approval to, and expedite and construction of, projects that are recommended by the appropriate federal defense agency as important to the national defense."

The bill authorizes expenditures of $327,000,000 ($163,500,000 annually) for the fiscal years ending June 30, 1942 and 43.

Federal Works Administrator Carmody, has announced the "approximate apportionment" to the various states of these federal aid funds. (See page 354 Excavating Engineer June, 1940). The amounts may be subject to certain changes when the official apportionment is made on or before December 31, 1940.

Discussing administration of the new defense highway provision at a press conference, Mr. Carmody frequently relied upon Commissioner MacDonald and others of the Public Roads Administration for details, particularly with reference to the construction and im-

Drilling and Fishing Tools

By

BUCYRUS ERIE

Your drill is no better than its weakest part. For the best results you need time tested, dependable tools that ask no favors; tools that are designed to do a job effectively and made of steels that give long service. Bucyrus-Erie tools have proved through years of service that they meet these requirements. Send for Tool Catalog and Price List today. And the next time you need drilling and fishing tools—try Bucyrus-Erie Service. Stocks are kept on hand at convenient warehouses in South Milwaukee, Wis.; Evansville, Ind.; Erie, Pa.; Englewood, N. J.; and Waterloo, Iowa, for your convenience.

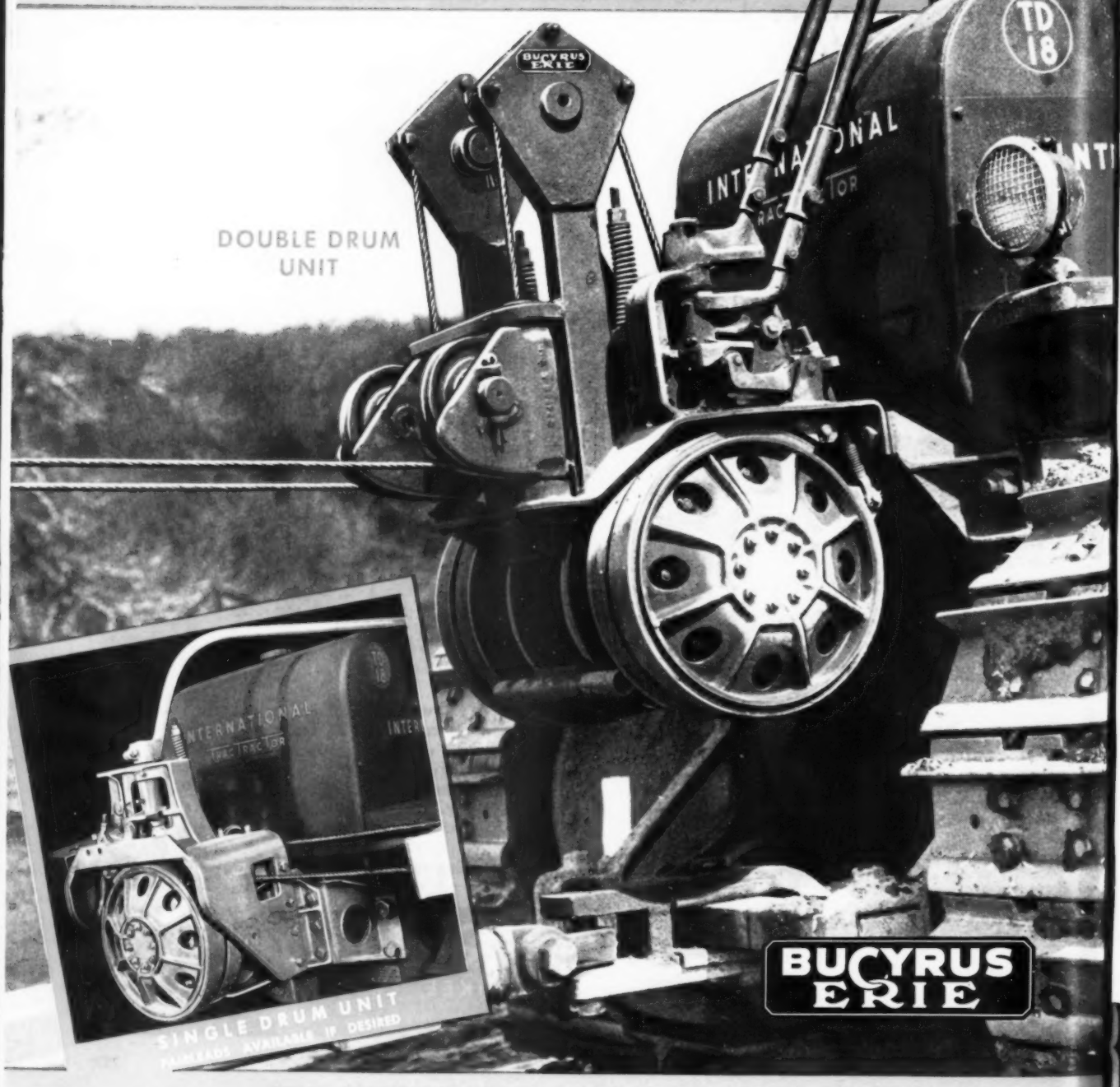
BUCYRUS-ERIE

SOUTH MILWAUKEE, WISCONSIN, U.S.A.

Excavating, Drilling, and Material Handling Equipment

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

The simplest, easiest operating Power Control Unit *ever made!!*



SEE YOUR International TracTracTor DISTRIBUTOR

r-
it
NTI
M
N
C
M
L

Just ask any operator who has handled one of these Winches how he likes them. His answer will be quick and smiling: "Never touched such easy-handling clutches in my life. They sure take hold mighty smooth and cool."

Then ask some engineer what he thinks of them. His answer will be just as quick and enthusiastic: "Beautiful! They're simple as 1-2-3."

Finally ask an owner. He'll say: "They sure run nice. The boys have no trouble with them and they give us the kind of steady, dependable performance we like in any equipment."

Don't take our word for it . . . ask the experts . . . or buy one and use it yourself! These engineered winches will help you cut costs and lick your jobs on schedule.

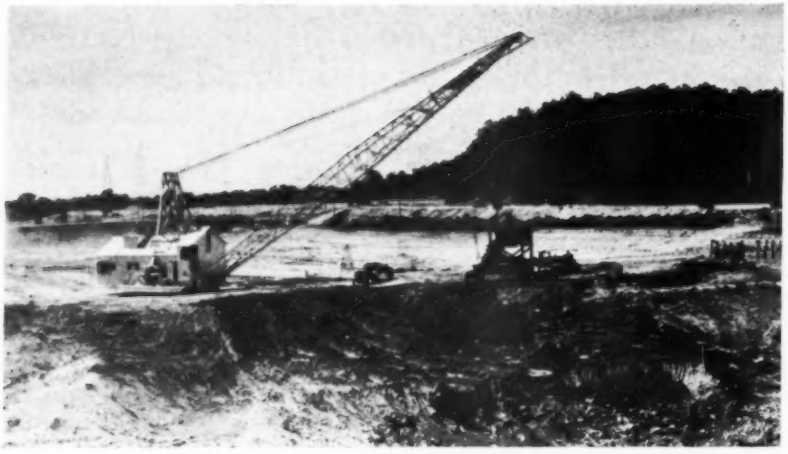
- Pays for itself in short time on cable and maintenance savings; clutches take hold smoothly and easily, preventing sudden shocks and strains on cable, gears, and bearings.
- Clutch bands can be changed in a few minutes without removing winch from tractor, without dismantling it, or removing oil seals.
- Simple planetary type.
- Strong shock-resisting alloy steel gears, with accurately cut teeth, case hardened and ground.
- Tough gear and sheave pins, case-hardened and ground.
- Durable steel-casting gear case.
- For accuracy and strength, castings are used extensively.
- Single oil-bath lubrication for all bearings, gears and drums.
- Only 5 oil seals required.
- Cool, large-area, external band-type brakes and clutches.
- Interchangeable clutch and brake bands.
- Single control lever for both clutch and brake on each drum.
- Simple one-point lever adjustment.
- Easy clutch and brake application with variable-ratio cam.
- Perfect cable-lead from winch with free-swinging fairleads.
- Ample capacity for rope.
- Simple easy-to-reach rope anchors.
- Produces rated rope pull on each layer of cable.
- Fits various makes and sizes of tractors; removable casting adaptors.

SPECIFICATIONS FOR SINGLE AND DOUBLE-DRUM UNITS

MODEL NUMBER NUMBER OF DRUMS	P-14 ONE	P-24 TWO	P-28 TWO
CABLE CAPACITY (½" dia. cable)	176'0"	176'0"	195'0"
MAXIMUM LINE PULL (First Layer)	4500 lbs.	4500 lbs.	7000 lbs.
LINE SPEEDS (First Layer)			
Standard Gear Reduction, 1200 r.p.m. — Power Take-Off	299 f.p.m.	302 f.p.m.	314 f.p.m.
Alternate Gear Reduction, 960 r.p.m. — Power Take-Off	347 f.p.m.	333 f.p.m.	346 f.p.m.
Alternate Gear Reduction, 850 r.p.m. — Power Take-Off	307 f.p.m.	294 f.p.m.	306 f.p.m.
Alternate Gear Reduction, 560 r.p.m. — Power Take-Off	202 f.p.m.	194 f.p.m.	

ucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN



● Excavation on the spillway of the Kentucky Dam, TVA project near Paducah, Kentucky, is handled by a Bucyrus-Monighan walking dragline loading to Euclid dump wagons.

provement of strategic highways.

There are no military roads as such in the United States, it was explained, but close collaboration between the War Department and the Public Roads Administration has disclosed that roads necessary for military purposes are already in existence and in use by everyday traffic. The War Department has published a special highway map showing that there are approximately 75,000 miles of our present highway system that have special military and strategic value. Many miles of this strategic system were said to need improvement—widening, strengthening, straightening.

The following information relative to the strategic system was made available to the press by Mr. Carmody:

Total mileage of network--miles	75,000
Total number of rural bridges---	16,000
Number of rural bridges with capacity less than 30,000 lbs.---	1,800
Number of rural bridges with vertical clearance less than 12½ feet ----------	150
Number of rural bridges with horizontal clearance less than 18 feet ----------	1,700
Approximate mileage of road surface less than 18 feet. wide ----------miles	5,500
Approximate mileage of road surface to be strengthened ---------- miles	14,000

Any highway capable of serving military traffic is capable of handling normal movements of commercial vehicles, and vice versa. The cost of improving the roads and bridges of the strategic system is now the subject of an engineering survey being conducted by the Public Roads Administration with the assistance of the state highway departments. The results of this survey are expected to be reported in a couple of months and form the basis of future requests to Congress for additional funds.

OBITUARY

H. H. Timken, Sr.

H. H. Timken, Sr., chairman of the board of The Timken Roller Bearing Company, died Monday, October 14, in his home at Canton, Ohio. The immediate cause of his death was pneumonia, which developed from chronic asthma. His illness was of short duration.

Although still active in the business which he founded with his father and brother, in 1898, his two sons, H. H. Timken, Jr. and W. Robert Timken in recent years have taken an active part in the management of the company.

Mr. Timken attended St. Louis, Missouri Public Schools and spent many of his vacation periods in his father's carriage works, where he observed first hand the processes of manufacturing and had his first introduction to industrial efficiency. Upon his graduation from St. Louis High School, where he was an honor student, he enrolled in Washington University in St. Louis. He entered the University of California and was graduated from there with a law degree. Admitted to the bar in California, he immediately began the practice of law in San Diego.

When his father reentered the carriage and wagon-making field in St. Louis, he gave up law and joined him in the business. Beginning as a day laborer, he worked from the ground up. He became a foreman, then a department head, and finally, factory manager. It was shortly after his advancement to his position of factory manager that his father perfected the principle of the Timken tapered roller bearing, the chief applications of which were on Timken wagons and carriages. Within a comparatively short time bearings and axles formed the bulk of the Timken production.

Mr. Timken was a philanthropist and benefactor to many and varied charitable institutions and welfare agencies. Most recent of his gifts is the new Canton Timken Vocational High School, built and furnished with the most modern equipment. It was begun in the fall of 1937 and was completed for the opening of the 1939-1940 school year, at a cost of approximately $1,500,000. Today it is recognized as the finest school of its type in the country and serves as a model for other communities interested in vocational training for boys and girls of high school age.

In later years, Mr. Timken had spent the winter and spring months in Palm Springs, California, and summers at his lodge on Georgian Bay.

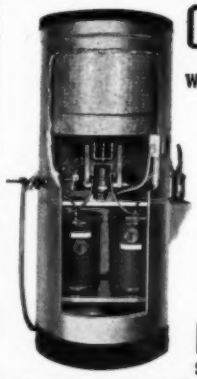
Survivors are Mrs. Timken; three sons, Henry H., Jr., W. Robert, and John; a brother, William R. Timken; a sister, Mrs. Cora B. Burnett, and two grandchildren.

HAYWARD BUCKETS

PLAY SAFE . . .
CHOOSE HAYWARDS

Hayward Buckets won't fall down on the job, cause time out, or require costly repairs.

THE HAYWARD COMPANY
52-54 Church Street
New York, N. Y.



Oil Users - Savings Plus

with the new Bucyrus-Erie Oil Reclaimer

1—Filters lubricating oil of any quality or grade from either gasoline or diesel engines.

2—Returns up to 90% of your used crankcase oil ready for re-use.

3—Saves from 60 to 80% on your oil cost.

Write today for complete story.

BUCYRUS-ERIE CO.
SOUTH MILWAUKEE, WIS., U. S. A.

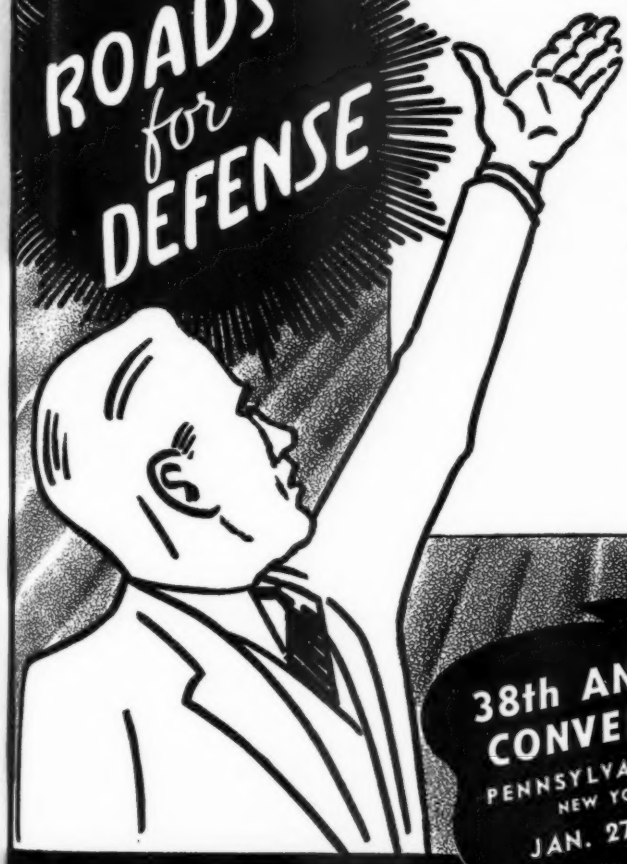
For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

Come and get the Answers!

- What does military transport do to roads?
- A new field for the contractor—the airport!
- Super highways—the big jobs of the future!
- What about new things in Snow and Ice Control?
- *Your* bidding problems—what are they?
- The legal angle on contracting—things you need to know!
- How shall we redesign intersections?
- Why develop the interregional roads?
- How do taxes affect your profits?
- Traffic—how to analyze it!

ROADS for DEFENSE

These subjects are close to your pocketbook—men who have found the answers are going to tell you about them—give you a chance to discuss them—ask questions! Here's the year's opportunity to get real help on the things that are bothering you most. *Note the date—plan now to come!*



-MOTION PICTURES
-INSPECTION TRIPS
-OPEN DISCUSSION
-EXCHANGE OF EXPERIENCES
-FUN!

38th ANNUAL CONVENTION
PENNSYLVANIA HOTEL
NEW YORK CITY
JAN. 27-31, 1941

AMERICAN ROAD BUILDERS ASS'N.
International Building Washington, D. C.

Building America's No. 1 Airport

(Continued from page 699)

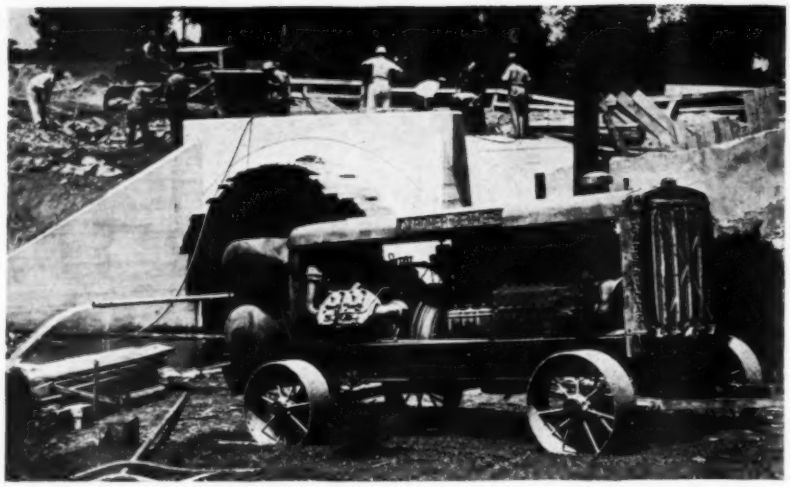
ated asphalt mixing plant was capable of producing 100 tons per hour. Two black-top pavers handled the entire surfacing job. According to engineers on the job this was the largest single paving, contract, based on quantity, ever let in the world.

All aggregate used on the project was obtained from the Potomac River channel and screened, washed and graded by an aggregate plant erected on the field.

Road work on the project consisted of the construction of various access and service roads as well as the relocation of three miles of the Mt. Vernon Memorial highway.

An unusual feature of the Washington National Airport will be the accommodations for those people who like to watch flying operations. Provision has been made for terraced parking spaces capable of holding 5,000 automobiles and a grandstand overlooking the field with a capacity of 3,000 spectators has also been provided. Every effort is being made in the construction of the airport buildings and landscaping of the grounds to make this "air park" worthy of its position near the nation's capitol.

Col. R. C. Thomas is the U. S. Engineers Corps officer in charge of construction operations at Washington National Airport. The civilian engineer in charge is Gayle McFadden, with the engineering division headed by J. W. Moss.



• A soft, mucky seep hole in the hydraulic fill area is cleaned out by a Bucyrus-Erie 20-B dragline. The hole is then refilled with sand to speed drying and stabilization of the airport surface.

Eight Suggestions for Tax Economy

(Continued from page 697)

loss because their cost records are inadequate. So aside from this matter of tax economy, it is good business practice to keep your records so that you can estimate profitably. From the standpoint of tax, accurate recordings assure the inclusion of every expense. We know of many excavating contractors who pay small bills and sometimes large expenses out of pocket without recording them, such as tolls, stamps, long distance phone calls, truck expenses, etc. Expenses paid out in this way seldom reach the books, hence, are never deducted from gross income when making the tax return. Over the year such outlays, even though small by themselves, total large. A petty cash fund should be established to record all small expenses not paid for by check.

• Depreciation may be claimed whether equipment has been used or not. Failure to take a yearly depreciation allowance keeps up the taxable value of the equipment.

7. Know Your Tax Laws

Keep abreast of income tax laws. Courts frequently render decisions which may change methods of computing tax in your favor, likewise with amendments to existing laws. If you over-pay through ignorance of such changes, you may be out of luck because the Treasury Department may not enlighten you. Do not base returns upon decisions made several years ago. They may be changed at any time. Newspapers and business magazines often report such changes. File them for

• Do not set the same depreciation rate on all equipment. Estimate the life of each unit separately and deduct accordingly.

reference. If in doubt about any phase of tax return preparation, consult your banker or the nearest income tax office.

8. Your Legal Rights

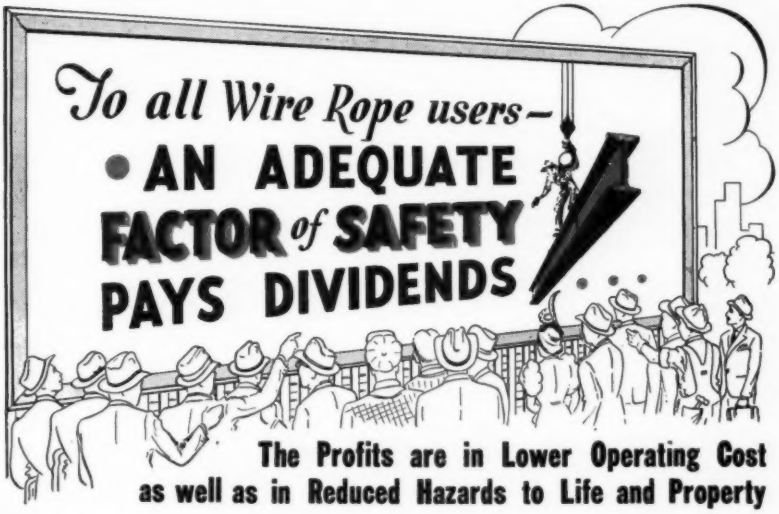
When a transaction may be interpreted in more than one way with equal propriety, use the interpretation in your favor. This is not tax evasion. It is tax avoidance. There is a big difference. The Supreme Court has ruled that, "The legal right of the taxpayer to decrease the amount of what otherwise would be his taxes or altogether avoid them, by means which the law permits cannot be doubted. It is well settled that a taxpayer may resort to any legal methods available to him to depreciate the amount of his tax liability, so long as his efforts are confined to law."

With 35 states having some form of income tax law, about 25 per cent levying a "use" tax, about 75 per cent requiring returns of some kind plus federal taxes, the excavating contractor should make every effort to economize on tax expense. These eight suggestions, followed intelligently, will help attain that objective.

The Fight for Success

One of the most important lessons in life is that success must continually be won and is never finally achieved. There are those who look upon the supposed fortunate in our social efforts, who achieved places of influence and distinction, as though they had in some way gained a citadel in which they stand secure against every attack. In truth, all they have done is to gain another level of responsibility in which they must make good. Every day is one of test. Every day puts at risk all that has been gained. The greater the apparent achievement the greater the risk of loss. The farther you have climbed, the more disastrous the fall. As has well been said, it is not worth while to talk of the end of a period, for you are always at the beginning of a new one. You cannot rest content. You have been vigilant; it remains to be yet more vigilant. You have been faithful, but fidelity is an active virtue which demands its daily sacrifice of any counter interest, its daily response in energetic service."

—Charles Evans Hughes.



The Profits are in Lower Operating Cost as well as in Reduced Hazards to Life and Property

Assuming that you have selected a wire rope of high quality and proper construction, there is one other vital consideration that will affect both the safety and economy of your work — *An Adequate Factor of Safety.* If there is not a proper ratio between the strength of the rope and the *maximum* load to be handled, the rope may be overstressed . . . a condition no rope can long survive, and the result is premature failure — and possibly a serious accident.

For general purposes, it is never advisable for the working load of a wire rope to exceed one-fifth of its breaking strength. This means that the Factor of Safety should be not less than five.

Factors of safety in excess of five, varying up to eight and even more, are often required, depending upon the various classifications of service. For any classification a careful and thorough consideration should be made of all pertinent data, including loads, acceleration, deceleration, speed, length of rope, attachments, size and arrangement of sheaves and drums, conditions causing corrosion and abrasion, and the degree of danger to life and property. Should any doubt arise we suggest that you consult a wire rope manufacturer.

This advertisement is published for the purpose of helping all wire rope users obtain safer and more economical service from their wire rope

A. LESCHEN & SONS ROPE CO.

WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

NEW YORK • • • 90 West Street
CHICAGO • • 810 W. Washington Blvd.
DENVER • • • 1554 Wazee Street

HERCULES WIRE ROPE

SAN FRANCISCO • • 520 Fourth Street
PORTLAND • • 914 N. W. 14th Avenue
SEATTLE • • 3410 First Avenue South

For your convenience in writing to A. Leschen & Sons Rope Co., you will find a card bound in this issue.

Safety Valve

(*Continued from page 695*)

8-hour shifts daily on the conduit excavation. One peculiarity of the job was that no material was hauled in dump trucks from the 37-B's. All excavated material, except the bottom rock from the pressure basin, was piled up beside the excavation and later used for backfilling.

Collapsible forms were used for the pressure conduit and concrete was mixed and poured with a gasoline-powered 27-E Rex. Dry sand and gravel, mixed in proper proportions, was purchased locally and delivered to the job, the contractor adding the Portland cement and water and doing the mixing with his own equipment.

Mill River Re-routed

Construction of the pressure conduit in the former channel of Mill River necessitated the building of wooden flumes to carry the waters of the stream past the work. This presented an interesting problem at the Columbus Avenue concrete bridge, where the single arched opening through which Mill River flowed was to be made an integral part of the pressure conduit. This was solved by delaying the joining of the conduit to the bridge concrete until Mill River could be re-diverted down along the conduit invert . . . and praying that no heavy rains would bring too much water for the flume to handle.

Seepage into the conduit trench and pressure basin. as well as the constant discharge of brilliantly colored dye water from the thread mill into the pressure basin, made many pumps necessary for dewatering purposes.

The snow dump section was supported on wooden piles, driven with a steam hammer supported by a Northwest crane. Vertical walls of the snow dump are high enough above recorded flood water height so that in case of flood the snow dump, itself, becomes a sort of pressure basin.

Backfilling was done with a La-Plant-Choate bulldozer mounted on an RD-8 Caterpillar tractor. Material was spread in thin layers and compacted by the tractor treads. The 16,200 cubic yards of borrow required to cover the pressure conduit in the former channel of Mill River was purchased from and delivered by other suppliers, but all material was filled in, spread and compacted as above.

Wage rates were under the control of the U. S. Department of Labor, but F. H. McGraw & Company paid higher wages than the minimums required by law. The following hourly rates were paid on the job:

Class of Work	Min. Rate	McGraw Rate
Pneumatic hammer operators	.60	.66
Unskilled laborers	.56	.62½
Tractor operators	.75	1.00
Reinforcing rod setters	1.12½	1.50

Job officials for the U. S. Engineer office were: Col. J. S. Bragdon, district engineer, Providence District; A. S. Wyman, area engineer, West Springfield Area; and J. B. Edgerton, resident engineer.

Frank H. McGraw is president of F. H. McGraw & Company and C. S. Strike is vice-president. U. D. Gosselin supervised the job, assisted by Harry Mathews and R. Hutchinson.

NOT ONE CENT FOR REPAIRS *in* 17 YEARS!

Every working day, for 17 years, a Williams ¾ Yard Bucket has been unloading crushed rock and sand from railroad cars for the Concho Sand and Gravel Co., Oklahoma City. In all that time of heavy duty service, not one penny has been paid for repairs or maintenance. Now a set of pins and bushings is being shipped to start the bucket, as good as new, on another seventeen years of service.

Williams Buckets and Parts are stocked by distributors in all sections of the country.

Send for free bulletins covering Williams Buckets for all types of services.

THE WELLMAN ENGINEERING CO.
7002 CENTRAL AVENUE • CLEVELAND, OHIO

Now WELDED *Rolled Steel* CONSTRUCTION

WILLIAMS *Buckets* *built by* WELLMAN

For your convenience in writing to The Wellman Engineering Co., you will find a card bound in this issue.

Where to Buy BUCYRUS ERIE and BUCYRUS MONIGHAN Products

For Shovels, Draglines, Cranes, Clamshells, Skimmers, and Dragshovels 'Phone or Write the Nearest Dealer or Branch Office Listed Below.

For Large Shovels and Draglines, Walking Draglines, Bucyrus-Ruth Excavators, Blast-Hole, Prospecting, Oil Well, and Water Well Drills, 'Phone or Write the Nearest Bucyrus-Erie Branch Office Indicated Below with an *

ALASKA: (See Washington, Seattle).
ARKANSAS, LITTLE ROCK: Lyons Machinery Company.
CALIFORNIA, LOS ANGELES: Crook Company, 2900 Santa Fe Avenue, Phone Kimball 5137.
*SAN FRANCISCO: Bucyrus-Erie Company, 390 Bayshore Blvd. Phone Atwater 2341.
OAKLAND: Industrial Equipment Co., Outer Harbor.
COLORADO, DENVER: Ray Corson Machinery Co., 1646 Wazee Street.
CONNECTICUT, NEW HAVEN: The W. I. Clark Co., 1811 Dixwell Ave.
FLORIDA, JACKSONVILLE: Quinn R. Barton, Inc., 1305 W. Forsyth St.
*GEORGIA, ATLANTA: Bucyrus-Erie Co., 1508 William-Oliver Bldg. Phone Jackson 1545.
ATLANTA: R. S. Armstrong & Bro. Co., 676 Marietta. Phone Jackson 2010.
IDAHO, BOISE: The Intermountain Equipment Co., Broadway at Myrtle St. Phone 171.
*ILLINOIS, CHICAGO: Bucyrus-Erie Company, 1312 Bankers Bldg., 105 W. Adams Street. Phone Franklin 5321.
CHICAGO: Great Lakes Supply Corp., 824 W. 36th St.
INDIANA, INDIANAPOLIS: A. F. Deaney, 719-721 N. Pine St.
IOWA, CEDAR RAPIDS: James W. Bell, 916—16th N. E.
DAVENPORT: Harry Alter & Sons, 514 S. Howell St.
KANSAS, PITTSBURG: Bucyrus-Erie Co., 309 East 4th St. Phone 164.
KENTUCKY, LOUISVILLE: Brandeis Machinery & Supply Co., Brook & Warnock Sts. Phone Magnolia 6600.
MAINE, PORTLAND: Maine Truck-Tractor Co., 158 Veranda St.
MARYLAND, BALTIMORE: Stuart M. Christhilf & Co., 205 Snow Bldg. Phone Calvert 4310.
*MASSACHUSETTS, BOSTON: Bucyrus-Erie Company, 240 N. Beacon St. Phone Stadium 3152.
MICHIGAN, DETROIT: E. D. Coogan, 10410 E. Jefferson Ave.
MINNESOTA, CROOKSTON: Wm. H. Ziegler Co., Inc., 1115 So. Main St.
DULUTH: Wm. H. Ziegler Co., Inc., 304 Lake Ave., So. Phone Melrose 681.
MINNEAPOLIS: Wm. H. Ziegler Co., Inc., 2331 University Ave., S. E. Phone Gladstone 7971.
MISSISSIPPI, JACKSON: Mississippi Road Supply Co., Telephones: Long Distance 9906. Local 3676.
*MISSOURI, KANSAS CITY: Bucyrus-Erie Company, 1007 Fairfax Bldg. Phone Harrison 4811.
*ST. LOUIS: Bucyrus-Erie Company, 818 Olive St.—Suite 906. Telephone Chestnut 1354.
MONTANA, MISSOULA: Westmont Tractor & Equip. Co.
NEBRASKA, OMAHA: Cardinal Supply & Mfg. Co., Sunderland Bldg.
OMAHA: Fuchs Mchy. & Supply Co., 1102 Farnam Street.
*NEW JERSEY, ENGLEWOOD: Bucyrus-Erie Company, 214-216 South Dean Street. Phone 3-6737.
NEW MEXICO, ALBUQUERQUE: R. L. Harrison Co., Inc., 209 N. 4th Street.
*NEW YORK, NEW YORK: Bucyrus-Erie Company, 30 Rockefeller Plaza, Suite 5050. Phone Columbus 5-4395.
ALBANY: Contractors Sales Co., Inc., P. O. Box 949.
MINEOLA: H. O. Penn Machy. Co.
NEW YORK: H. O. Penn Machy. Co., Inc., 140th St. and East River.
POUGHKEEPSIE: H. O. Penn Machy. Co.
*SYRACUSE: Bucyrus-Erie Company, 303 Draper Ave. Phone 6-1078.
NORTH CAROLINA, GREENSBORO: E. F. Craven Company.
OHIO, CINCINNATI: Bode-Finn Co., 1654 Central Avenue.
CLEVELAND: W. T. Walsh Equipment Co., 3088 W. 106th St.
COLUMBUS: H. S. Robertson, Walhalla Rd. Phone Jefferson 3242.
ZANESVILLE: Southern Ohio Equip. Co., 941-3 W. Main St.
OKLAHOMA, GUTHRIE: Clarence L. Boyd Co., Inc., 501 West Oklahoma.
OKLAHOMA CITY: Clarence L. Boyd Co., Inc., 17 S.W. Pottawatomie St.
OREGON, PORTLAND: Clyde Equipment Co., 17th & Thurman Streets. Phone Broadway 5561.
*PENNSYLVANIA, PHILADELPHIA: Bucyrus-Erie Company, 821 Commercial Trust Bldg. Phone Rittenhouse 4281.
PHILADELPHIA: Furnival-Rimmer Co., Lancaster Ave. at 54th St. Phones: Trinity 5200 and West 1617.
BRADFORD: Beckwith Mchy. Co., 361 Congress St.
HARRISBURG: Beckwith Machinery Co., 635 N. Cameron St. Phone 4-4064.
KINGSTON: Beckwith Machinery Co., 249 Market St.
*PITTSBURGH: Bucyrus-Erie Co., 1502 Clark Bldg. Phone Atlantic 4815.
PITTSBURGH: Beckwith Machinery Co., 6550 Hamilton Ave. Phone Monrose 4300.
TENNESSEE, KNOXVILLE: Brooks Equipment & Mfg. Co., 408-10 Davenport Rd.
MEMPHIS: Road Builders Equipment Co., Third and Calhoun Sts.
TEXAS, DALLAS: E. B. Chambers, 1806 Tower Petroleum Bldg. Phone 2-2942.
ABILENE: R. B. George Machinery Co.
DALLAS: R. B. George Machinery Co., 1135 S. Lamar St.
EL PASO: Tri-State Equipment Co., 500 E. Overland Ave.
HOUSTON: Gulf Tractor & Equip. Co., 3100 Polk Ave.
PECOS: Tri-State Equipment Co.
TYLER: R. B. George Machinery Co.
UTAH, SALT LAKE CITY: The Lang Co., 267 N. First St.
VERMONT, BARRE: Reynolds & Son, Inc.
VIRGINIA, RICHMOND: Virginia Tractor Co., Inc., 1628 W. Main St.
WASHINGTON, SEATTLE: Clyde Equipment Co., 3410 First Ave., South.
*SEATTLE: Bucyrus-Erie Co., 3408 First Ave., So. Phone Main 6424.
SEATTLE (for Alaska): Northern Commercial Co., 419 Colman Bldg.
SPOKANE: Construction Equipment Co., 1118 Ide Ave.
WEST VIRGINIA, CLARKSBURG: General Equip. Co., Inc., 414 N. Fourth St.
HUNTINGTON: Chas S. Porter Supply Co., 424 Fourth Ave.
WISCONSIN, MILWAUKEE: W. L. Hartley, 2446 N. 62nd St., Wauwatosa, Wis.

Canada

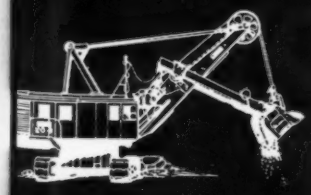
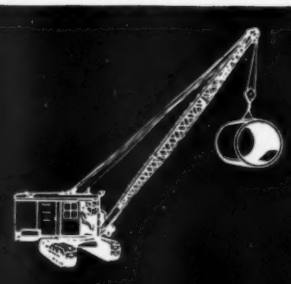
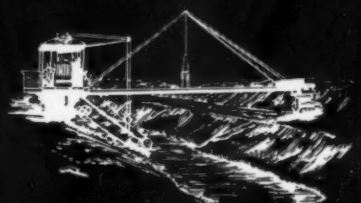
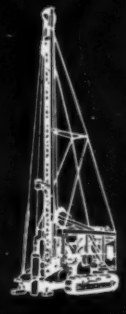
BRITISH COLUMBIA, VANCOUVER: Finning Tractor and Equip. Co.
MANITOBA, WINNIPEG: Kipp-Kelly, Ltd., 68 Higgins Ave.
ONTARIO, TORONTO: F. H. Hopkins & Co., Ltd., Commerce & Transportation Building.
QUEBEC, MONTREAL: F. H. Hopkins & Co., Ltd., 340 Canada Cement Bldg., Phillips Square. Phone Plateau 1136.

For Bucyrus-Erie Tractor Equipment — Bulldozers, Bullgraders, Hydraulic and Cable-Controlled Scrapers, Rippers, Tamping Rollers and Power Control Units See Your
International Industrial Power Dealer

You can choose a modern Bucyrus-Erie and be sure of getting performance exactly suited to your needs. In 60 years Bucyrus-Erie has built over 30,000 machines for the excavating, drilling and material-handling field. With sales and service representation in all principal countries of the world, Bucyrus-Erie has a breadth of experience that is added assurance of the performance you want.

Bucyrus-Erie

GENERAL OFFICES: SOUTH MILWAUKEE WISCONSIN U. S. A.

Notes from the manufacturers

The Wellman Engineering Company, Cleveland, Ohio, recently appointed G. S. Swanson as Cleveland district sales manager of Williams clamshell and dragline buckets. Mr. Swanson, for the past several years, has been associated with the Pettibone-Mulliken Corporation, Chicago, but is an old-timer with Williams buckets. He was formerly employed by the G. H. Williams Company, Erie, Pennsylvania prior to Wellman's purchase of the bucket division of the Williams Company about nine years ago.

Elastic Stop Nut Corporation, Union, New Jersey, announces that Harold B. Thomas, one of the founders of this organization and vice-president in charge of sales, has resigned to enter consulting work in industrial product analysis and market research. He remains active as a director and member of the executive committee of the corporation.

American Brake Shoe and Foundry Company, according to an announcement by W. B. Given, Jr., president, has appointed W. M. Black as president of the company's American Manganese Steel division. Mr. Black became general sales manager of this division in 1934 and vice-president in 1935. He has been with "Amsco" since 1912, with the exception of the war years when he served as a lieutenant in the U. S. Ordnance department. This division was formerly headed by W. E. Crocombe who remains as president of the American Forge division of the company.

Raybestos-Manhattan, Inc., has purchased the Brighton Mills plant adjacent to the main plant of the Manhattan Rubber Mfg. division at Passaic, New Jersey, according to an announcement made by F. L. Curtis, general manager. This property includes approximately five and one-half acres on which are buildings with 240,000 square feet of floor space. It is situated on the Delaware, Lackawanna and Western railroad.

The Associated Pennsylvania Constructors will hold their annual convention and banquet December 11, 12, and 13 at the Penn-Harris Hotel in Harrisburg, Pennsylvania. Several important speakers will headline a very interesting program which also includes a floor show featuring acts of stage and radio fame. Open house will be held by various equipment and material dealers during the convention.

New trade literature

Title: "Construction Planning and Plant"
Subject: Comprehensive manual dealing with planning, control, and execution of large construction jobs. Gives description, comparison, data, for many types of construction machinery. Also, many practical methods and details from actual experience including work on the Tennessee Valley dams.
Where to Get: McGraw-Hill Book Company, 330 West 42nd Street, New York. Price $4.00.

Title: "Coal Report—Illinois 1939"
Subject: The fifty-eighth annual coal report of the state of Illinois with which are also included the reports of all other divisions of the department of mines and minerals.
Where to Get: State of Illinois, Department of Mines and Minerals, Springfield, Illinois.

Title: "Tufflite Concentrator Floodlighting Unit"
Subject: Two page illustrated leaflet describing this new floodlighting unit. Included in the booklet are hints on application and a complete description of the construction employed in

Direct Subway Entrance to all Points of Interest

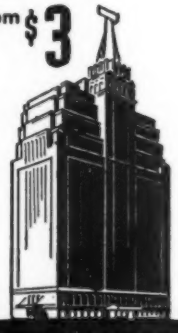
New York's Popular

HOTEL LINCOLN

44TH TO 45TH STS. AT 8TH AVE.

OUR CHOICEST ROOMS From $3

1400 ROOMS each with Bath, Servidor, and Radio. Four fine restaurants acclaimed for cuisine.



MARIA KRAMER
PRESIDENT
John L. Horgan
Gen. Mgr.
HOTEL EDISON
SAME OWNERSHIP

IN THE CENTER OF MID-TOWN NEW YORK

COME... SEE HOW IT'S DONE IN '41

CONCRETE INDUSTRIES EXPOSITION
CHICAGO
FEB. 10-11-12

CONCRETE contractors, concrete products and ready-mix men: home builders interested in the fast growing use of concrete and concrete products: general contractors, engineers and public officials: this is *your* show! Plan now to attend!

HOTEL SHERMAN
CHICAGO ILL.

For your convenience in writing to the advertisers on this page, you will find a card bound in this issue.

POSITIONS WANTED

Positions wanted advertisements will be run under this heading for 5 cents per word, minimum charge $1.00. Advertisements for help wanted free of charge.

Address all box numbers c/o EXCAVATING ENGINEER . . . . . at South Milwaukee, Wisconsin

BLAST HOLE DRILL OPERATOR

Blast hole drill operator, 10 years' experience on gas, diesel and electric, large and small machines. Can do own repair work. Middle age, single and willing to go anywhere in U.S.A. Excellent references. Box 9160

EXPERIENCED OPERATOR

Operator with fifteen years' experience on gasoline and diesel powered shovels, draglines, and crane-clamshell machines on highway and sewer construction jobs desires steady work anywhere. Preference: Northwest shovel or dragline about 2 yard capacity. Can do own repair work. References furnished. Age 32. Married. Now located in Missouri. Box 9159

SUPT.-FOREMAN

With 20 years' experience of concrete work on all kinds of buildings, bridges, highway roads. Will go anywhere in United States. Best reference. Box 9165

BLAST HOLE DRILL OPERATOR

Three years' steady employment on Loomis Clipper "44", Cyclone piston type 1200-G and Bucyrus-Armstrong 27-T and 42-T, gas and electric blast hole drills on Penna. anthracite coal field. Able to make repairs. Unmarried. Age 39. Now located in Pennsylvania; willing to go anywhere. Can furnish best of references. Wants steady job on any blast hole drill; preference Armstrong. Box 9161

ALL-AROUND OPERATOR

Can operate any kind of machine, large or small. Can do own repair work. Have had experience in quarry, ore and coal stripping; familiar with grading work. Can operate steam, diesel, gas or electric. Would like steady employment on large-scale operation. Will furnish references. Box 9164

CABLEWAY OPERATOR

Experienced slackline cableway operator wants work operating slackline or dragline. References.

Tom N. Hudson
Route 4, Boone, Iowa

this industrial floodlight.

Where to Get: Department 7-N-20 or 8-N-48 of the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania. Free upon request.

Title: **"Owen Grapples"**

Subject: Booklet dealing with the structure, sizes, capacities, dimensions, weights, etc. Also many action illustrations of a variety of jobs where the grapple is used.

Where to Get: The Owen Bucket Company, 5500 Breakwater Avenue, Cleveland, Ohio. Free upon request.

Title: **"Manhattan V. D. B. Wheels"**

Subject: An attractive new bulletin which describes the new vibration dampener bushing resilient mounting now being built into Manhattan wheels for portable grinders.

Where to Get: The Manhattan Rubber Mfg. Division, Passaic, New Jersey. Bulletin No. 6878 is free upon request.

Title: **"New Line of Mixed Flow Pumps"**

Subject: New publication illustrating and describing a new line of figure 6360 mixed flow vertical propeller pumps.

Where to Get: Fairbanks, Morse & Company, 600 South Michigan Avenue, Chicago, Illinois. Free upon request, ask for bulletin No. 6360.

Title: **"Drive Data Book for Condor Whipcord Endless Belt"**

Subject: The book lists standard sizes of two styles of this endless flat belt and more than 1,500 drives of all types available with these standard stock belts.

Where to Get: The Manhattan Rubber Mfg. Division, Passaic, New Jersey. Free upon request.

Title: **"Transmission Belt"**

Subject: Conventional sales copy and engineering data on Hewitt transmission belts.

Where to Get: Hewitt Rubber Corporation, Buffalo, New York. Free upon request.

Title: **"Off-The-Highway Tires"**

Subject: A handy reference booklet which furnishes data and information on super-traction tires including a quick-check chart showing types of service and typical applications. Written especially for contractors and those users of pneumatic rubber tires in earthmoving, road-building and general contracting services.

Where to Get: B. F. Goodrich Company, Akron, Ohio, or any one of their district offices. Free upon request.

Title: **"General Supercrane"**

Subject: The wheel mounted crane is described in dramatic word-and-picture stories in a new bulletin.

Where to Get: The General Excavator Company, Marion, Ohio. Bulletin No. 4018 is free upon request.

Title: **"Small Scraper Folder"**

Subject: Applications and uses of small scrapers described and extensively illustrated. The six page, two color folder deals with Carryalls in sizes from 3 to 11 yards.

Where to Get: LeTourneau—"Caterpillar" dealers or R. G. LeTourneau, Inc., Peoria, Illinois. Free upon request.

Title: **"Spherical Roller Bearings"**

Subject: An attractive 36-page catalog devoted to illustrations of roller bearing applications in mining, crushing, steel, paper, ore, railroad and allied fields along with helpful information on bearing selection, time-saving computations and drawings of various types of roller bearing design.

Where to Get: S. K. F. Industries, Inc., Philadelphia, Pennsylvania. Free upon request.

For your convenience in writing to The Owen Bucket Co., you will find a card bound in this issue.

Title: **"Monel, Nickel and Nickel Alloys Bulletin"**
Subject: Technical information on welding, brazing and soft soldering of monel, nickel and inconel.
Where to Get: Development and Research Division, The International Nickel Company, Inc., 67 Wall Street, New York, New York. Free upon request, ask for bulletin T-2.

Title: **"Allis-Chalmers HD-7 Catalog"**
Subject: Stressing performance to do the job and protection against lost time, this twenty-four page, two color catalog emphasizes the five main features of this 54 h.p. tractor.
Where to Get: Allis-Chalmers Manufacturing Company. Milwaukee, Wisconsin. Free upon request.

Title: **"All-Wheel-Drives"**
Subject: Literature dealing with the application of snow-removal equipment on Marmon - Herrington all - wheel - drive truck and convertibility for cut and fill work, grading, hauling, etc.
Where to Get: Marmon-Herrington Company, Inc., Indianapolis, Indiana. Free upon request.

Title: **"Waterproofing and Dampproofing Literature"**
Subject: Four descriptive and illustrative booklets entitled "Membrane Waterproofing" (Form TB-3), "Dampproofing" (Form TB-4), "Waterproofing" and "Dampproofing for Waterworks" (Form TB-5), and "Waterproofing and Dampproofing for Sewage Disposal Plants."
Where to Get: Koppers Company, Tar & Chemical Division, Pittsburgh, Pennsylvania. Free upon request.

Title: **"Blaw-Knox Buckets"**
Subject: Comprehensive 36-page catalog on two-line lever arm buckets. Two hundred and forty-two individual bucket specifications are involved, ranging from ⅓ to 7½ cubic yards. Also included is useful data on counterweights, equalizer bars and bucket teeth. Illustrated job stories are included in the contents.
Where to Get: Blaw-Knox Company, Pittsburgh, Pennsylvania. Free upon request, ask for catalog No. 1757.

Title: **"Biglode Dragline Bucket Booklet"**
Subject: The many features of the Biglode bucket are illustrated with photographs and diagrams.
Where to Get: Harnischfeger Corporation, Milwaukee, Wisconsin. Free upon request, ask for bulletin D-9.

Title: **"Snow Fighters"**
Subject: How to deal with heavy winter snow is pictorially described. Actual operating views of Caterpillar equipment on snow removal jobs are among the many illustrations found in this booklet.
Where to Get: Caterpillar Tractor Company, Peoria, Illinois. Free upon request.

FOR SALE

RATES: 60c per line—minimum charge $2.40. Repeat insertions with no change in copy—three insertions for the price of two. ¶ Display advertising in this section at published display advertising rates. ¶ Estimate 41 characters per line, counting all spaces and punctuation as one character each. Allow ten characters for box number for blind advertisements. If address given, counts same as advertising copy. ¶ Rates are net (no commission, no discount) and payable in advance of publication. Send your remittance with insertion order and copy. ¶ Closing date—15th of preceding month. Example—January issue closes December 15.

Address all box numbers c/o EXCAVATING ENGINEER . . . . . at South Milwaukee, Wisconsin

SMALL SHOVELS, CRANES AND DRAGLINES
Up to 2½ Cubic Yards

BUCYRUS-ERIE 42-B 1½-yd. Steam Shovel. Good operating condition. Located Maryland. Box 2634

BUCYRUS-ERIE 10-B Gas Dragline. First class condition. Located California. Box 2599

BUCYRUS-ERIE 1030 Gas Combination Shovel, Clamshell, and Drag Shovel with three dippers. 40' boom. Electric starter. Wisconsin engine. Located Massachusetts. Box 2652

BUCYRUS-ERIE GA-2 High Lift 1 yd. Shovel and 45' Boom Crane. Waukesha WS engine. Single Shaft Cats. Operating condition. Located eastern Pennsylvania. Box 2566

BUCYRUS-ERIE 37-B Gas Dragline. 2-cu. yd. bucket. Kohler 1½ KW Light Plant. 2 flood lights. 40' boom. Long and wide cats. Wisconsin 6 cylinder engine. Good operating condition. Located Mississippi. Box 2601

LINK-BELT MODEL K-48 Gas Shovel. 1¾-yd. Esco dipper. Good operating condition. Located Montana. Box 2618

BUCYRUS-ERIE GA-2 Gas-Air high lift shovel. 24' boom. 18'4" dipper handle. 1¼ yd. dipper. Waukesha 6¼"x8" 4-cylinder engine. Electric starter. Quantity spare parts included. Excellent condition. Located Eastern Pennsylvania. Box 2559

KOEHRING MODEL 1-A. Combination 40' boom crane and dragline. Gasoline. Wisconsin engine. Operating condition. Located near St. Louis. Box 2402

KEYSTONE MODEL 4 — Gasoline dragshovel. Operating condition. Located western Pennsylvania. Box 2526

BUCYRUS-ERIE E-2 Diesel Combination Shovel, Dragline and Clamshell. Dipper 1¼ yd. Clamshell-Dragline boom 50'. Atlas engine. Excellent mechanical and operating condition. Located St. Louis. Box 2655

NORTHWEST 6—1½ yd. Shovel. Twin City Oil Engine. Operating condition. Located California. Box 2482

BUCYRUS-ERIE 50-B Electric Shovel. 30' boom, 17' dipper handle, 2-cu. yd. dipper. 3 motor suitable for power supply 3 phase 25 cycle 440 volt. Excellent condition. Located Southern Wisconsin. Box 2638

FOR SALE. Account owner retiring from business. Bucyrus-Erie 10-B Gas Shovel. Electric starter. Good mechanical condition. Owner will sacrifice. Box 2641

INDUSTRIAL-BROWNHOIST. 40' boom Clamshell including 1¼-yd. Owen bucket. Buda Gas engine. Located Central Illinois. Box 2633

If You Do Not Find What You Want Listed — Write Us
EXCAVATING engineer
South Milwaukee, Wis.

BUCYRUS-ERIE 50-B Steam Coal Loader. 2-yd. dipper with sides built up to 2¼-yd. Turbine Light Plant. A-1 condition. Quantity spares included. Ready to operate. Located Indiana. Box 2620

KOEHRING MODEL 702 1¾ yard Dragline. 70' boom. Caterpillar Diesel D-13000 engine. Located eastern Pennsylvania. Box 2656

BUCYRUS-ERIE Model E-2 diesel crane and dragline, shop No. 10984, equipped with 50 ft. boom, Kohler Light Plant and Atlas diesel engine. Located Eastern Oklahoma. Bargain. Box 2611

BUCYRUS-ERIE 50-B Steam Shovel. 27' boom, 18' dipper handle, 1½-yd. dipper. Now operating. Located Kansas City, Missouri. Box 2636

BYERS MODEL 128 ⅜-yard Gas Shovel. 35' Clamshell Boom and ½-yard Erie Clamshell Bucket and Back Hoe. Hercules Engine. Good operating condition. Reasonably priced. Located near Pittsburgh, Pa. Box 2495

LORAIN MODEL 60, 1-yd. Gas Shovel. Electric Starter. Waukesha Engine. Good operating condition. Located Minnesota. Box 2594

BUCYRUS-ERIE Type B High Lift ¾-yard steam shovel. Operating condition. Located vicinity Boston. Box 2401

BUCYRUS-ERIE 10-B Gas Dragline and ⅜-yd. Page RM bucket. Good operating condition. Located Colorado. Box 2635

LORAIN ¾-yard Combination Gas Shovel and 40' boom dragline including drag bucket. Waukesha engine. Good operating condition. Located Oregon. Box 2632

BUCYRUS-ERIE 30-B Diesel 50' boom Dragline. 1¼ yd. Page drag bucket. Good operating condition. Located Illinois. Box 2540

BUCYRUS-ERIE 43-B Gas Shovel. 23' boom, 17' dipper handle, 1½-yd. dipper. Chain crowd. Electric starter. Wisconsin 6-cylinder 6"x7" Model E engine. Extensively repaired. Excellent shape. Located vicinity Boston. Box 2556

BUCYRUS-ERIE 45-B—45' boom Dragline 2½ yd. drag bucket. Buda Diesel engine. Good opating condition. Located Louisiana. Box 2665

NORTHWEST NO. 2 Gas Combination ⅝ yard Shovel and 40' boom Clamshell and Dragline including Kiesler ⅝ yd. clamshell bucket. Wisconsin engine new in 1936. Excellent condition. Located Spokane, Washington. Box 2649

BUCYRUS-ERIE 1030 Gas Combination Shovel, Clamshell, and Drag Shovel with three dippers. Electric starter. Wisconsin engine. Recently thoroughly rebuilt. Located eastern New York State. Box 2653